Chapter 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This chapter describes the existing condition of the environment that could be affected by implementing the Applicant's Proposed Action Alternative or other alternative routes and the known and predicted effects on the existing natural and human environment from construction, operation, and maintenance of the B2H Project and associated actions. The Chapter 3 analysis includes impacts associated with substations under the Proposed Action. The information for the affected environment and the environmental consequences is provided for each resource and environmental topic analyzed in the Final EIS. Section 3.2 of this chapter is organized into resource subsections as follows:

- 3.2.1 Earth Resources
- 3.2.2 Water Resources
- 3.2.3 Vegetation
- 3.2.4 Wildlife Resources
- 3.2.5 Fish Resources
- 3.2.6 Land Use
- 3.2.7 Agriculture
- 3.2.8 Recreation
- 3.2.9 Transportation
- 3.2.10 Lands with Wilderness Characteristics
- 3.2.11 Potential Congressional Designations
- 3.2.12 Visual Resources
- 3.2.13 Cultural Resources
- 3.2.14 Native American Concerns
- 3.2.15 National Historic Trails
- 3.2.16 Air Quality and Climate Change
- 3.2.17 Socioeconomics and Environmental Justice
- 3.2.18 Public Health and Safety

Section 3.3 presents the cumulative effects associated with the B2H Project.

Section 3.4 identifies proposed LUP Amendments to authorize the Agency Preferred Alternative route, as well as other proposed LUP Amendments required should another route ultimately be selected for construction, followed by an analysis of the potential environmental impacts associated with each LUP Amendments.

3.1.1 SUMMARY OF CHANGES FROM THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Based on comments received by the BLM on the Draft EIS and collaboration with the counties, a number of recommended route-option variations were incorporated into the network of alternative routes analyzed for the Final EIS (refer to Sections 2.1.1.3 and 2.5.2). Analysis of the alternative routes is reported throughout Chapter 3.

Comments on the Draft EIS expressed that not enough information was provided in the Draft EIS to enable the reviewers to understand where impacts would occur and where mitigation would be applied to reduce impacts. Chapter 2, Section 2.5.1 of the Final EIS presents an explanation of the study and analysis approach employed for the B2H Project, Chapter 3 has been expanded to provide more description of the methods used for analyzing effects associated with each resource (tiered to the overall approach) and to provide more information about the resources, mitigation applied to reduce impacts, and residual impacts on resources along each alternative route by segment. In addition, a map volume of large-scale maps is provided to present resource data and to show the level of residual impacts on the resources along all of the alternative routes.

To provide distinction between the issues relevant to and the management emphasis relevant to agriculture, recreation, and transportation, these resources are discussed separately from land use, in Sections 3.2.7, 3.2.8, and 3.2.9, respectively, in the Final EIS.

To provide distinction between the policy issues and the management emphasis relevant to BLM lands with wilderness characteristics, designated areas established by an act of Congress, and other special designations, lands with wilderness characteristics, and potential congressional designations are discussed in separate sections, Sections 3.2.10 and 3.2.11, respectively, in the Final EIS.

Further, information regarding designated TCPs in and adjacent to the B2H Project area is discussed in a section separate from cultural resources, Section 3.2.13.

3.1.2 AFFECTED ENVIRONMENT

In accordance with NEPA regulations codified at 40 CFR 1502.15, this section presents a summary of the existing condition of the human and natural environment in the areas that could be affected by the Applicant's Proposed Action Alternative and alternative routes. This information serves as a baseline from which the impacts anticipated to result from implementing the B2H Project were assessed.

These topics were selected based on federal regulatory requirements and policies, concerns of the lead and cooperating agencies, and/or issues derived from comments expressed by agencies and the public during scoping. Issues raised by the tribes during government-to-government consultation and by the public and agencies during scoping are presented in Section 1.6.3.

3.1.3 ENVIRONMENTAL CONSEQUENCES

The analysis of potential environmental effects predicts how a resource would be affected and the degree of change (impact) that could result from implementation of an action. Potential environmental

effects on each resource were determined through a systematic analysis that included assessing the impacts of each alternative route on the environment and how the impacts could be mitigated most effectively. An overview of the methodology for this analysis is presented in Section 2.5.1 and described for each resource in Section 3.2.

Although the federal agencies have no authority to either permit or prohibit construction of the Project on non-federal land, NEPA requires an analysis and disclosure of project effects on all lands, not just the effects to federal lands. Therefore, the EIS makes assumptions on where the B2H Project would be sited on non-federal lands and on how it would be designed and constructed. This is not meant to imply that the federal agencies are authorizing the Project on non-federal lands. Decisions on siting and construction requirements on non-federal lands are under the authority of state and local governments (in coordination with the landowner), and not the federal agencies. However, the federal agencies maintain some authority to regulate activities under Section 106 of the NHPA and Section 7 of the ESA.

3.2 RESOURCES ANALYZED

This section describes the affected environment and known and predicted effects of implementing the Project on resources relevant to the issues and concerns identified during agency and public scoping. The affected environment and effects analysis area were assessed for each alternative. Generally, each resource discussion is organized as follows:

- ***Introduction and Regulatory Framework***. A description of the resource and the laws, regulations, and policies related or relevant to management or analysis of the resource
- ***Issues Identified for Analysis***. A description of the issues identified for each resource that were analyzed for the B2H Project
- ***Methods***. Resource-specific methods used to assess the affected environment and initial and residual impacts for each alternative
- ***Affected Environment***. Organized by B2H Project segment, then by alternative and route variation
- ***Environmental Consequences***. Organized by B2H Project segment, then by alternative and route variation

A summary of baseline resource inventory and results of the effects analysis is presented in each resource section. Tables 2-18 through 2-35 present a comparison of results of the effects analysis for the alternative routes, Tables 2-19, 2-22, 2-25, 2-28, 2-31, and 2-34 present a summary of the 500-kV transmission line parallel conditions and jurisdiction by alternative route. Section 2.5.1.1 presents the estimates for ground disturbance, vegetation clearing, and the miles of access roads.

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3.2.1 EARTH RESOURCES (GEOLOGIC HAZARDS, SOILS, MINERALS, AND PALEONTOLOGY)

3.2.1.1 INTRODUCTION

This section describes earth resources within the B2H Project area and the regulatory framework governing these resources. It also describes the scoping issues, affected environment, methods of resource evaluation, and environmental consequences on earth resources from the B2H Project. The following issues regarding earth resources are addressed:

- Geologic hazards that could affect the B2H Project, including earthquakes and landslides
- Potential impacts on soil resources in the B2H Project area, such as soil erosion and compaction and removal of soil resources from productivity, including soil on farmlands; also, soil suitability for reclamation
- Leasable, locatable, and salable mineral deposits
- Paleontological resources that are known to exist in the B2H Project area, and geologic units that previously have produced fossils

3.2.1.2 REGULATORY FRAMEWORK

GEOLOGIC HAZARDS

Federal

No federal regulations apply to the management of geologic hazards. However, the 2012 International Building Code (International Code Council 2011) provides building standards for structures (which may be affected by geologic hazards), including special standards for structures located within seismically active areas. Local building codes may require that B2H Project structures conform to the international standards.

State

Oregon's EFSC oversees facility-siting standards and site-certificate applications. OAR 345-022-0020 (Structural Standard) and OAR 345- 021-0010(1)(h) (Contents of an Application, Exhibit H) outline EFSC facility standards and application requirements related to geologic and soil stability. To issue a site certificate, the EFSC "must find that the applicant can design, engineer, and construct the facility to avoid dangers to human safety presented by seismic hazards" (OAR 345-022-0020(1)(b)).

SOILS

Federal

The EPA oversees the prevention and management of soil erosion through stormwater management regulations under the Clean Water Act (CWA)(33 U.S.C. 1251 et seq.). The CWA's National Pollutant Discharge Elimination System (NPDES) stormwater program requires operators of construction sites of one or more acres (as well as smaller sites that are part of a larger common POD) to obtain authorization to discharge stormwater under an NPDES construction stormwater permit (40 CFR 122).

The development and implementation of SWPPPs are the focus of NPDES stormwater permits for regulated construction activities. The runoff from stormwater could be a factor in soil erosion by water.

Federal agencies also have handbooks and other guidance governing soil management that are applicable to their jurisdictions.

Applicable U.S. Forest Service handbooks (FSH), found in Forest Service Manual (FSM) 2500, *Watershed and Air Management* (USFS 2010), for evaluating soil conditions on National Forest System lands include the following:

- Soil Management Handbook (FSH 2509.18)
- Soil and Water Conservation Practices Handbook (FSH 2509.22)
- Watershed Conservation Practices Handbook (FSH 2509.25)
- Watershed Protection and Management (FSH 2520, R6 Supplement 2500-98-1)
- Interim Directive No. 2520-2013-1 (best management practices [BMPs] for sediment reduction from forest roads)
- Wallowa-Whitman National Forest LMRP (USFS 1990)—contains qualitative soil management requirements that would be applicable to the B2H Project

The BLM also has several documents related to soil managing resources, and that are applicable to the B2H Project, including the following:

- *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (referred to as the Gold Book)* (BLM and USFS 2007)—a guidance document for permitting and drilling oil and gas wells; the document also contains general standards for road construction and stormwater BMPs
- *BLM Instruction Memorandum OR-2011-074, Incorporating Road and Sediment Delivery Best Management Practices into Resource Management Plans* (BLM 2011)—lists BMPs that provide direction regarding road maintenance practices and road-related actions with the intention of minimizing or preventing sediment delivery to water(s) of the U.S.
- BLM Manuals MS 9113 (Roads); 9113-1 (Road Design Handbook); 9113-2 (Roads Inventory and Condition Assessment Guidance and Instructions); and 9115 (Primitive Roads); Manual 9112 (Bridges and Major Culverts)

Baker Resource Management Plan and Record of Decision

The *Baker RMP* (BLM 1989) directs that soils be managed to maintain productivity and minimize erosion. To implement that management directive, the plan states the following:

- Actions shall be planned to coordinate soil, water, and air concerns and activities with other resources in all phases of management actions, from the planning stage to final monitoring of the results.
- All proposed resource projects and surface-disturbing activities shall be reviewed to ensure that soils and watersheds are protected, rehabilitated, or improved.

- Projects shall be monitored to ensure that stipulations and specifications for soil and water protection achieve the desired results.
- Standard design features normally incorporated as needed into specific surface-disturbing activity plans and authorizations include: scalping, saving, and respreading available topsoil; regrading to natural contours; re-establishing appropriate stabilizing vegetation; and installing water erosion and runoff prevention measures, such as waterbars, benches, and drainage systems.
- Management activities in riparian areas will be designed to maintain or improve riparian values; roads and utility corridors will avoid riparian zones to the extent practical.

Owyhee Resource Management Plan

The *Owyhee RMP* (BLM 1999) contains the following objectives and management actions for soil-disturbing activities that may occur in the B2H Project area:

> **Objective**: Achieve stabilization of current, and prevent the potential for future, localized accelerated soil erosion problems, particularly on stream banks, roads, and trails. (Localized accelerated soil erosion is where humans, by their actions, are responsible for the site-specific erosive process.)
>
> **Relevant Management Actions and Allocations**: (1) Review authorizations for site-specific surface-disturbing activities (e.g., road building, drill pad construction, and utility lines) to ensure that approved BMPs are incorporated to reduce soil erosion and keep sediment yields to a minimum. (2) Limit surface-disturbing activities on soils that are sensitive to compaction, have a high soil erosion potential rating, or are exhibiting existing accelerated erosion problems.

Southeastern Oregon Resource Management Plan

The *Southeastern Oregon RMP* (BLM 2002) contains the following BMPs for soil erosion protection:

> **Surface-Disturbing Activities:** (1) Special design and reclamation measures may be required to protect scenic and natural landscape values. This may include transplanting trees and shrubs, mulching and fertilizing disturbed areas, using low-profile permanent facilities, and painting to minimize visual contrasts. Surface-disturbing activities may be moved to avoid sensitive areas or to reduce the visual effects of the Proposed Action. (2) Reclamation shall be implemented concurrently with construction and site operations to the fullest extent possible. Final reclamation actions shall be initiated within 6 months of the termination of operations unless otherwise approved in writing by the authorized officer. (3) Fill material shall be pushed into cut areas and up over back slopes. Depressions that would trap water or form ponds shall not be left.
>
> **Rights-of-Way and Utility Corridors:** (1) Rights-of-way and utility corridors shall use areas adjoining or adjacent to previously disturbed areas whenever possible, rather than traverse undisturbed communities. (2) Waterbars or dikes shall be constructed on all of

the rights-of-way and utility corridors and across the full width of the disturbed area, as directed by the authorized officer. (3) Disturbed areas within road \ and utility corridors shall be stabilized by vegetation practices designed to hold soil in place and minimize erosion. Vegetation cover shall be re-established to increase infiltration and provide additional protection from erosion. (4) Sediment barriers shall be constructed when needed to slow runoff, allow deposition of sediment, and prevent transport from the site. Straining or filtration mechanisms also may be employed for the removal of sediment from runoff.

Wallowa-Whitman National Forest Land and Resource Management Plan

The *Wallowa-Whitman National Forest LRMP* (USFS 1990) includes the following standards and guidelines related to the LRMP's goal of maintaining or enhancing soil productivity:

> **Conflicts with Other Uses:** Prioritize maintenance of soil productivity and stability over uses described or implied in all other management direction, standards, or guidelines.
>
> **Protection:** Give special consideration to scablands or other lands having shallow soils during project analysis. Such analysis will especially consider the fragile nature of the soils involved and, as needed, provide protection and other mitigation measures.

State

Most states, including Oregon, are authorized by the EPA to implement the stormwater NPDES permitting program. In Oregon, compliance with state requirements is necessary for stormwater management activities. The ODEQ (2010) Stormwater Program models its permits and requirements on the EPA program.

The Oregon EFSC provides for soil protection as part of its facility-siting standards and site-certificate application requirements. To issue a site certificate, the EFSC must find that the facility is not likely to result in a significant adverse impact on soils (OAR 345-022-0022). Exhibit I under OAR 345-021-0010(1)(i) outlines the EFSC application requirements related to soils.

The EPA remains the permitting authority in a few states (including Idaho) and territories and on most land owned by Native American tribes. For construction (and other land-disturbing activities) in areas where the EPA is the permitting authority, operators must meet the requirements of the EPA (2012) Construction General Permit.

MINERALS

On federal land, the BLM is the primary management agency for minerals. The BLM classifies mineral products as locatable, leasable, or salable. Locatable minerals include metallic minerals (gold, silver, lead, copper, zinc, nickel, etc.), nonmetallic minerals (fluorspar, mica, certain limestones, uranium, gypsum, clay, heavy minerals in placer form, and gemstones), and a variety of certain uncommon minerals. Mining of locatable minerals on public land is a right protected by the General Mining Law (Act) of 1872 (30 U.S.C. 22–42) and implementing regulations (43 CFR 3800–3870).

The BLM leases certain minerals, such as oil and gas, oil shale, geothermal resources, potash, sodium, native asphalt, solid and semisolid bitumen, bituminous rock, phosphate, and coal, on public and other federal lands. The BLM also leases these minerals on certain private lands where the mineral rights are owned by the federal government. Most of the minerals leased under this program are used to make fertilizer and to feed livestock or are used for energy development. Leasable minerals are regulated by 43 CFR 3000–3590 and the Mineral Leasing Act of 1920, as amended.

Salable minerals include sand, gravel, soil, rock, and building stone used for common construction uses. The BLM sells mineral materials to the public at fair market value but gives them to states, counties, or other government entities for free for public projects. Disposals of salable minerals from BLM-administered lands are regulated by the Materials Act of 1947, as amended, and 43 CFR 3600.

State

The Oregon Department of State Lands is responsible for managing, leasing, and selling state-owned mineral rights on approximately 3 million acres throughout Oregon. The department's authority derives from the Federal Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1234–1328) and from the department's rules (OAR 141-067).

The Idaho Department of Lands (IDL), through its State Board of Land Commissioners, administers mineral leases on approximately 3 million acres of state land, as well as on the beds of navigable waters, which, on statehood in 1890, were granted to the state in trust. The state leases its minerals to generate revenue for the endowment fund for public purposes, such as public schools, or for the general fund when public trust lands are involved. The state issues leases for metals, other mineral commodities, oil and gas, and geothermal resources on land and in navigable waters. In Idaho, the EPA, IDEQ, and IDL administer federal and state programs to oversee environmental requirements for mining, including environmental permitting for mine operation and postmining reclamation.

PALEONTOLOGICAL RESOURCES

Federal

Federal protection for important paleontological resources applies on federally owned or managed lands. For the purposes of this EIS, a "paleontological resource" means any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth (16 U.S.C. 470aaa). Federal legislative protection for paleontological resources began with the Antiquities Act of 1906 (16 U.S.C. 431 et seq.), which requires protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal land. The Antiquities Act forbids disturbance of any object of antiquity on federal land without a permit issued by the responsible managing agency. The act also establishes criminal sanctions for unauthorized appropriation or destruction of antiquities.

In addition to the Antiquities Act, other federal statutes protect fossils. The NEPA (42 U.S.C. 4321–4327) requires that important natural aspects of our national heritage be considered in assessing the

environmental consequences of any proposed action. The FLPMA (43 U.S.C.1701–1782) requires that public lands be managed in a manner that protects the quality of their scientific values.

The most explicit protection for paleontological resources, the Paleontological Resources Preservation Act (16 U.S.C. 470aaa), regulates who may collect fossils on public lands and where such fossils must be curated. The BLM pamphlet *Fossils on Public Lands* explains that "vertebrate fossils may only be collected with a permit because of their relative rarity and scientific importance. They include not only bones and teeth, but also footprints, burrows, and other traces of activity. Vertebrate fossils are fragile and complex; and permit applicants must be able to show a sufficient level of training and experience to collect them. In addition, all vertebrate fossils collected under a permit must be held in an approved repository." Management of paleontological resources on BLM-administered land is governed by BLM Manual Section MS-8270 (BLM 1998a) and the accompanying BLM Handbook 8270-1 (1998b). Handbook 8270-1 presents an area classification system for locations with varying fossil potential. This classification system has since been replaced by the Potential Fossil Yield Classification system (PFYC), as stipulated by BLM Instruction Memorandum 2008-009 (BLM 2009a), and is the classification system used in this environmental analysis.

BLM Instruction Memorandum 2009-011 (BLM 2009b) provides guidance for assessing impacts on paleontological resources to determine applicable mitigation actions for cases in which significant paleontological resources will be adversely affected by a federal action.

BLM RMPs provide additional guidance on paleontological resources. The *Baker RMP* (BLM 1989) states the following:

> Paleontological localities will be protected through review of all surface-disturbing proposals. Collecting of important vertebrate fossils will be allowed subject to existing restrictions and permitting requirements. Commercial or hobby collection of common fossils will be allowed subject to existing federal regulations.
>
> A regional data review and evaluation of the importance of known paleontological resources will be completed. Inventories for paleontological resources will be conducted in connection with individual project proposals. Important paleontological localities will be patrolled periodically to detect unauthorized uses or determine threats to the resource. Evaluation and protection of paleontological resources will be accomplished through coordination with professional paleontologists and DOGAMI [Department of Geology and Mineral Industries]. Volunteers may be used to assist in monitoring and inventories.
>
> Localities containing vertebrate fossils, and resources that may provide important scientific information, will receive priority for protection and evaluation, in comparison to common invertebrate or common plant fossil localities which are not ordinarily the focus of protection measures.

The *Proposed Southeastern Oregon RMP and Final Environmental Impact Statement* (BLM 2001:121) describes paleontological resources as the fossilized remains of plants and animals. It further states the following:

> Fossils are of Pliocene, Miocene, and Pleistocene age and are located in various volcanic tuff, sandstone/siltstone beds or Pleistocene gravels. Of particular interest are vertebrate fossils such as those of extinct camels, mammoths, giant sloths, turtles, and horses.
>
> Fossil localities have been reported on public land in the planning area. Most of the finds have been exposed by wind or water erosion, and they are widely dispersed, situated primarily along maintained county or BLM roads. Several localities are the subject of ongoing academic research.

The RMP also states that for paleontological management, an interagency agreement is in effect between the BLM's Burns, Vale, and Prineville Districts and the John Day Fossil Beds National Monument. This agreement provides for an exchange of technical expertise and other services.

3.2.1.3 Issues Identified for Analysis

Geologic Hazards

- Can the soils and geology sustain the construction and operation of the B2H Project?
- A seismic fault and geothermal resources occur in the B2H Project area. The area is composed of steep canyons, hills, valleys, and mountains that often experience seismic instability. What are the hazards associated with those features?
- What are the hazards posed by rockslides and landslides?
- What would B2H Project impacts be to cliffs and rock outcrops in the B2H Project area?

Soils

- Will removing vegetative cover cause soil erosion during spring runoff?
- What hazards are posed by soils that are highly erosive and unstable?
- Silt loam soil in some portions of the B2H Project area is highly wind erodible. What measures will be taken to prevent soil erosion by wind?
- What will be the B2H Project impacts regarding soil compaction?

Minerals

- What would be the B2H Project impacts on well sites and the injection field for the Neal Hot Springs Geothermal Project?
- What impacts on highly mineralized areas of gold, silver, platinum, opals, agates, and other valuable minerals found in Baker County are possible?
- What impact would the B2H Project have on mining claims in Owyhee County between Marsing and Murphy?
- Would the B2H Project restrict the ability to extract minerals?

PALEONTOLOGICAL RESOURCES

- Would the B2H Project violate the Federal Paleontological Resources Preservation Act (16 U.S.C. 470aaa)?
- Would the B2H Project adversely affect petrified wood on Lindsey Mountain and in the Kitchen Creek Valley (Oregon)?
- Would the B2H Project damage fossils?

3.2.1.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.2.1 and 2.5.1. This section describes how the study methods are applied to evaluate the existing conditions of geologic hazards, soils, minerals, and paleontological resources and to analyze environmental impacts on each resource.

For characterizing soils, minerals, and paleontological resources, the study corridor is 1 mile wide (i.e., 0.5 mile on each side of the reference centerline of the alternative routes). For geologic hazards, the study corridor is 2 miles wide (i.e., 1 mile on each side of the reference centerline of the alternative routes).

DATA SOURCES

Geologic Hazards

Earthquakes

The potentially affected area used for recorded historical earthquakes varies depending on earthquake magnitude. Using information from the seismology department at the University of Nevada at Reno as a guideline (Louie 1996), resource specialists established a 25-mile radius of potential effect for earthquakes less than magnitude 6.0, a 50-mile radius for earthquakes from magnitude 6.0 to less than 7.0, and a 100-mile radius for earthquakes of magnitude 7.0 or greater.

Historical earthquake data for Oregon was obtained from DOGAMI (2011a) and for Idaho was obtained from the Idaho Geological Survey (2011). This data was updated to include any new earthquakes since 2011. The historical earthquake epicenters were mapped within the 2-mile study corridor for the alternative routes. The historical earthquake data is discussed qualitatively based on the reported magnitude.

The Quaternary Period includes the past 2.6 million years of geologic time. Of the Quaternary faults identified by the U.S. Geological Survey (USGS), faults and fault zone segments less than 15,000 years old are fairly recent by geological standards and are likely to pose the greatest potential for future earthquakes (USGS 2006). Quaternary faults and Class B faults within the 2-mile study corridor of the alternative routes were identified. Class B faults are those faults where Quaternary deformation exists but either (1) the structure does not extend deeply enough to be a source of significant earthquakes, or (2) not enough evidence is available to classify the fault as a Class A Quaternary fault or a Class C fault (non-tectonic origin). To characterize the risk of Quaternary faults, more recent Quaternary faults were classified as having a higher chance to become active in the future.

Landslides

Landslides, including mudflows, mudslides, rock flows, rock slides, and debris flows, could occur in the geologic hazards study corridor. Landslides are often triggered by other natural events, including earthquakes or precipitation that is sufficient to cause earth movements. The analysis for landslides included data from the U.S. Department of Transportation's National Pipeline Hazard Index. The National Pipeline Hazard Index is based on information and data from the USGS and the USDA Natural Resources Conservation Service (NRCS) for locations of swelling clay, landslide incidence, landslide susceptibility, and land subsidence. Based on those four factors, landslide hazard rankings from 0 to 100 are assigned, with 0 representing the lowest ground-failure hazard and 100 representing the highest. Landslide hazard rankings between 85 and 100 are classified as a high risk for landslides, rankings between 70 and 84 are a moderate risk, and areas less than 70 are a low risk.

Subsidence

Subsidence, which is defined as the vertical collapse of the ground surface, can occur where land surface overlies natural underground voids, such as karst (sinkhole) topography or caves. Subsidence also can occur where land surface overlies underground voids that result from the removal of solid or liquid mineral resources; overlying land that is not adequately supported in such resource extraction areas can collapse. A review of the geology within several miles of the B2H Project showed that the B2H Project area does not contain either natural subsidence or locations containing large-scale mineral extraction that could lead to subsidence. Therefore, subsidence is not considered a geologic hazard to the B2H Project and, thus, is not discussed further in this EIS.

Volcanoes

The geologic hazards study corridor for characterizing the risk from active volcanoes to the transmission line extended 100 miles on each side of the Proposed Action and each alternative route. Although volcanic ash could travel 100 miles, the thick clouds of ash and gases necessary to cause shorting of transmission lines, or weight damage, would likely be dispersed at 100 miles from all but the largest volcanoes (Scott et al. 1995). No active volcanoes are present in the study corridor. The closest volcano monitored by the USGS is near Bend, Oregon, in the Cascade Range, which is more than 130 miles away from the Project (USGS 2016). Because there are no active volcanoes located within 100 miles of the B2H Project, volcanoes are not considered a geologic hazard to the B2H Project and, therefore, are not discussed further in this EIS.

Floodzones

Floodzones are geographical areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk. FEMA data and data from the Office of Pipeline Safety (OPS) *National Disaster Study, National Pipeline Risk Index Technical Report* (OPS 1996), were used to evaluate the flood hazard rankings for the geologic hazards study corridor. The OPS data provide flood hazard rankings for the U.S., including those portions of Oregon and Idaho near the B2H Project. Flooding risk (based on FEMA mapping) was used to produce flood hazard rankings from 0 to 100, with 0 representing the lowest flood hazard and 100 representing the highest. Flood hazard rankings of 85 to 100 represent a high risk from flooding, rankings of 70 to 84 represent a medium risk, and rankings less

than 70 represent a low risk. For the B2H Project corridor, the combined OPS and FEMA mapping data for flood risks were used to determine the areas of medium and high flood risks within the 2 mile geologic hazards study corridor. The area (in acres) of medium and high flood risk within the 2 mile geologic hazards study corridor was calculated.

Soils

Soils Inventory data were obtained from the NRCS and mapped in the study corridor at two scales of resolution: (1) the finer-scale State Soil Geographic Database (STATSGO) and (2) the coarser-scale Soil Survey Geographic Database (SSURGO). For the B2H Project, SSURGO data were used as much as possible since it represents a more detailed analysis; STATSGO data were used in areas where SSURGO data were not available. In addition, a review of the NRCS Soil Surveys was performed to identify soil types of soils in the study corridor (USDA 1954; 1976; 1980; 1983; 1985; 1988; 2003). Per the NRCS data, soil factors that could cause increased soil erosion or soil compaction or that are difficult to revegetate were identified. Further, the following factors were considered in the evaluation of soil conditions relevant to the B2H Project:

Wind Erodibility

The soil resources study corridor was overlaid on the NRCS geographic information system (GIS) wind erosion data to characterize existing soil conditions related to wind erodibility group (WEG). Soils assigned to WEG 1 or 2 are highly susceptible to wind erosion; soils assigned to WEG 3, 4, or 4L have a moderate susceptibility to wind erosion; soils assigned to WEG 5, 6, or 7 have a low susceptibility to wind erosion; and soils assigned to WEG 8 are not susceptible to wind erosion.

Water Erosion Potential

A soil's potential to erode by water runoff is measured by its K_w factor, a numerical factor representing the relative water erodibility of the whole soil. The susceptibility of a soil to water erosion is based on its assigned K_w value, K factor values range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by rainfall. Soils assigned a K_w value of 0.40 or higher have a high susceptibility to water erosion; whereas soils assigned a K_w value between 0.20 and 0.40 have a moderate susceptibility to water erosion. Soils assigned a K_w value below 0.20 have a low susceptibility to water erosion.

Compacted Soil

The compaction potential of soils was based on their clay content and drainage characteristics. For the analysis, clay content of 28 percent or higher was considered to have high compaction potential. Soils with moderately to highly poor drainage characteristics also were included in the analysis. Soils meeting both the high clay content and drainage characteristics are defined as highly compactable.

Stony-Rocky Soil

Stony-rocky soil contains a high percentage of coarse soil fragments, such as sand and gravel. Stony-rocky soil does not retain moisture as well as fine-grained soil and is poor in providing soil nutrients to

new or established vegetation. Areas with stony-rocky soil were identified by locating soils with related descriptors, from NRCS data, such as very cobbly loam, bedrock, and extremely stony loam.

Droughty Soil

Soil is considered droughty if it is unable to store enough water to meet plant requirements. Sandy and gravelly soils are droughty because they have low water-holding capacities. Droughty soil is coarse textured (sandy loam or coarser) and is excessively well drained. Areas with droughty soil were identified by overlaying the soil resources study corridor on the NRCS GIS data for soil classified as moderately to excessively well-drained sandy loam or coarser texture.

Unique or Prime Farmlands

Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and also is available for these uses. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables (NRCS 2015).

Reclamation Potential

The reclamation potential of soil was developed by combining the characteristics of compaction potential, stony-rocky soil, and droughty soil. With these characteristics combined, impact levels of high, moderate, and low were determined for reclamation potential.

Minerals

Data for mineral resources was obtained from the BLM's LR-2000 database and the USGS. This data provided areas containing mineral resources, including active mines, mining claims, and mining leases (mineral products not typically specified), oil and gas wells and leases, geothermal leases, past producers, closed mines, and mineral occurrences.

PALEONTOLOGICAL RESOURCES

The geologic units for the paleontological resources study corridor were derived from the USGS integrated geological map databases (Ludington et al. 2007). The PFYC was derived from information from the BLM Vale and Baker City Field Offices. Because Oregon does not currently have PFYC values for geologic units, these values were estimated based on the type of bedrock (igneous, metamorphic, and sedimentary), similarities to others with known PFYC values, and comparisons to other projects where the PFYCs were estimated.

ANALYSIS AREA

Geologic Hazards

The geologic hazards study corridor is 2 miles wide (i.e., one mile on either side of the reference centerline for the alternative routes). Additional information on the approach to identifying the best available data within this study corridor is presented in the Data Sources subsection.

Soils

The soil resources study corridor is 2 miles wide (i.e., one mile on either side of the reference centerline for the alternative routes). The study corridor was overlaid on the NRCS GIS soils data to characterize existing soil conditions.

Minerals

The mineral resources study corridor is 2 miles wide (i.e., one mile on either side of the reference centerline for the alternative routes). Data for mineral resources, including spatial information, were obtained from BLM sources and the USGS. BLM's LR-2000 database (http://www.blm.gov/lr2000) also was reviewed. This data provided areas containing mineral resources, including active mines, mining claims and mining leases (mineral products not typically specified), oil and gas wells and leases, geothermal leases, past producers and closed mines, and mineral occurrences.

Paleontological Resources

For this EIS, paleontological analysis is based on interviews with BLM Oregon and State paleontologists and on reviews of paleontological information at BLM Vale and Baker City Field Offices (Pritchard 2011). To complete the paleontology analysis, the alternative routes were plotted on geologic maps to calculate route distances across each geologic unit.

The paleontological resources study area extends 1 mile on either side of the reference centerlines of the alternative routes. The BLM uses its PFYC system (BLM 2009a) to classify geologic units according to their fossil potential. The five PFYC levels include:

- Class 1 (very low): not likely that a geologic unit has recognizable fossil remains
- Class 2 (low): not likely to contain vertebrate fossils or scientifically significant invertebrate fossils
- Class 3 (moderate or unknown): various significance, abundance, and predictable occurrence or unknown fossil potential
- Class 4 (high): high occurrence of significant fossils
- Class 5 (very high): highly fossiliferous and predictable or significant fossils that are at risk of adverse impacts or degradation

The PFYC system further divides Classes 3, 4, and 5 into "a" and "b" categories. Class 3a is defined by bedrock units with moderate potential for vertebrate fossils or scientifically important invertebrate fossils, while Class 3b is applied to rock units with unknown fossil potential. Classes 4a and 5a apply to rock units with little or no soil or vegetative cover. Fossils in rocks lacking soil or vegetative cover are most susceptible to natural degradation or human-caused damage or collection loss. Classes 4b and 5b apply to bedrock with lower potential for natural or human-caused fossil disturbance because of several factors, including protective soil or vegetative cover.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Geologic Hazards

Criteria were developed to assess the intensity of potential effects resulting from geologic hazards on the B2H Project (Table 3-1). Quaternary faults younger than 150 years that are crossed were assigned a high level of intensity of impacts since they are the most recent and potentially could still be active. Quaternary faults older than 150 years but younger than 15,000 years before present (B.P.) were assigned a moderate level of intensity of impacts. Those Quaternary faults that are older than 15,000 B.P., and Class B faults were assigned a low level of intensity of impacts. Intensity for landsliding was based on an area's landslide susceptibility based on the OPS Hazard Index. Since historical earthquakes represent past events, historical earthquakes within the geologic hazards study corridor are mapped and discussed qualitatively. Floodzones were ranked by percentile using the hazard rank mapping of the OPS Hazard Index.

Table 3-1. Criteria for Assessing Intensity of Impacts from Geologic Hazards

Intensity of Impacts	Description
High	• Landslide areas with the highest percentile rank (85 to 100) • Areas where Quaternary faults(younger than 150 years) are present • Areas in Zone A and AE for flooding[1]
Moderate	• Landslide areas with moderate percentile rank (70 to 84) • Areas with Quaternary faults (greater than 150 years, but less than 15,000 years) are present • Areas in Zone X for flooding[1]
Low	• Landslide areas with lowest percentile rank (0 to 69) • Areas with Class B faults and Quaternary faults older than 15,000 years • Areas in 0.2 percent annual chance for flooding[1]

Table Note: [1]Based on Federal Emergency Management Agency

Soils

Criteria were developed to assess the intensity of potential effects on soil resources associated with implementation of the B2H Project (Table 3-2). These criteria were based on susceptibility of soils to water and wind erosion with the application of the B2H Project access model that is discussed in Section 2.5.11.

Table 3-2. Criteria for Assessing Intensity of Impacts on Soils	
Intensity of Impacts	**Description**
High	• Disturbance of land surface where soils exhibit high susceptibility to erosion by water or wind on slopes greater than 15 percent (i.e., access levels 2, 5, and 6) • Construction of new access roads across designated Prime or Unique Farmland soils • Low reclamation potential
Moderate	• Disturbance of land surface where soils exhibit high susceptibility to erosion by water or wind on slopes between 0 and 15 percent (i.e., access levels 3 and 4) • Disturbance of land surface where soils exhibit moderate susceptibility to erosion by water or wind on slopes greater than 15 percent • Improvement of existing roads in areas where soils exhibit moderate susceptibility to erosion by water or wind • Moderate reclamation potential
Low	• Disturbance of land surface where soils exhibit high susceptibility to erosion by water or wind on slopes between 0 and 8 percent and existing access is present (i.e., access level 1) • Disturbance of land surface where soils exhibit moderate susceptibility to erosion by water or wind on slopes less than 15 percent (i.e., access levels 1, 3, and 4) • Disturbance of land surface where soils exhibit low susceptibility to erosion by water or wind for all slope gradients (i.e., all access levels) • Use of existing roads • High reclamation potential

Minerals

The criteria used to assess mineral resources for the B2H Project are shown in Table 3-3.

Table 3-3. Criteria for Assessing Intensity of Impacts on Mineral Resources	
Intensity of Impacts	**Description**
High	• Active mines, producers, and active mining claims • Producing oil and gas or geothermal wells • Permitted mines
Moderate	• Coal leases • Oil and gas leases • Geothermal leases • Prospects
Low	• Potential mineral areas[1]
Table Note: [1]Areas where a mineral resource potential is identified but is not currently being developed (e.g., occurrence or closed mine)	

Paleontological Resources

Criteria were developed to assess the intensity of potential effects on paleontological resources associated with implementation of the B2H Project. These criteria were based on the PFYC rating for geologic units within the B2H Project area and are shown in Table 3-4.

Table 3-4. Criteria for Assessing Intensity of Impacts on Paleontological Resources	
Intensity of Impacts	**Description**
High	• Geologic units having a Potential Fossil Yield Classification of 4 or 5
Moderate	• Geologic units having a Potential Fossil Yield Classification of 3
Low	• Geologic units having a Potential Fossil Yield Classification of 1 or 2

Effects Analysis

Geologic Hazards

Assessment of Initial Impacts

The level of potential impacts on the B2H Project from geologic hazards that could result from implementation of the B2H Project is used for assessing initial impacts of geologic hazards. Based on the level of potential effects on the geologic hazards, initial impacts were assigned using the criteria presented in Table 3-1 and are presented in Table 3-5.

Mitigation Planning and Effectiveness

The following design features will be implemented to help mitigate the impacts on and from geologic hazards:

- **Design Feature 6 (Reclaim Construction Areas)**. Surface reclamation and revegetation in areas where ground disturbance occurred would help to stabilize slopes.

In addition to the design features of the B2H Project for environmental protection (refer to Table 2-7), such as surface reclamation and revegetation in areas where ground disturbance occurs to stabilize soils, Selective Mitigation Measure 4 (i.e., minimizing cut and fill of slopes to the extent possible) would be applied where feasible in areas with moderate or high landslide potential to reduce the risk of landslides and associated impacts on the B2H Project.

Further, the engineering and design of the transmission line towers by the Applicant's engineers typically exceeds earthquake-induced loads; therefore, seismic-induced accelerations on the tower structures are not considered a geologic hazard. The Applicant would be required to follow the 2012 International Building Code design standards for earthquake-resistant structures for all other B2H Project structures, which would further reduce the risk of damage from earthquakes.

Prior to construction, geotechnical investigations of ground stability in the vicinity of potential blasting areas would be conducted, particularly in areas identified as having shallow bedrock or in areas of instability identified by the Oregon DOGAMI SLIDO-2 (2011b), to inform tower design and engineering and tower placement, which would minimize the risk of blasting-induced landslides and associated effects on the B2H Project. The Applicant would conduct geotechnical studies of the terrain types in which construction would take place, including site-specific studies of areas where blasting would be conducted to accommodate tower construction, as proposed in a Framework Blasting Plan in its *Revised Plan of Development* (Idaho Power Company 2011: Appendix F). The Applicant would prepare and include a Blasting Plan Framework as Appendix C6 in its POD as a condition for approval of the

right-of- way application. The Applicant would define the procedures to prevent any unstable condition that may result from blasting operations. Blasting operations would be designed to mitigate unstable soil or geologic conditions that could result in hazards to people or property, such as landslides, mudslides, and ground failure.

Residual Impacts

Table 3-5 summarizes the initial impacts (based on the intensity of potential effects) from geologic hazards, the selective mitigation measures that would be applied to mitigate potentially adverse effects by geologic hazards, and residual impacts.

Table 3-5. Summary of Initial and Residual Impacts From Geologic Hazards

Geologic Hazard	Initial Impact	Selective Mitigation Measures Applied	Residual Impact
Quaternary faults younger than 150 years B.P. (before present)	High	None	High
Landslide areas with highest percentile rank (85 to 100)	High	4	Moderate
Quaternary faults older than 150 years, but younger than 15,000 years B.P.	Moderate	4	Moderate
Landslide areas with moderate percentile rank (70 to 84)	Moderate	4	Low
Landslide areas with lowest percentile rank (0 to 69)	Low	None	Low
Class B faults and Quaternary faults older than 15,000 years B.P.	Low	None	Low

Additional Analysis

In addition to the analyses shown in Table 3-5, earthquake epicenters, floodplains, and liquefaction potential within the study corridor also were identified for the B2H Project.

Soils

Assessment of Initial Impacts

The level of potential impacts of the B2H Project on soils that could result from implementation of the B2H Project is used for assessing initial impacts on soils. Based on the level of potential effects on soils, initial impacts were assigned using the criteria presented in Table 3-2 and are presented in Table 3-6.

Several design features of the B2H Project for environmental protection (refer to Table 2-7) are included in the B2H Project description that will avoid, reduce, or minimize impacts on soils, including:

- **Design Feature 1 (Plan of Development)**. A POD would be prepared that would include a Reclamation, Revegetation, and Monitoring Framework Plan that would help mitigate soil erosion.
- **Design Feature 6 (Reclaim Construction Areas)**. Reseeding and revegetation would be used to mitigate soil erosion.
- **Design Feature 7 (Salvage Topsoil for Revegetation)**. To help mitigate erosion and assist with revegetation efforts, topsoil would be salvaged and segregated prior to construction, to be redistributed and contoured evenly over the surface.

- **Design Feature 10 (Speed Limit on B2H Project Access Roads)**. To minimize dust on traveled roads, a speed limit of 25 miles per hour would be employed.
- **Design Feature 17 (Work During Wet Periods)**. Vehicles would not be allowed to travel when soils are moist enough for deep rutting.
- **Design Feature 35 (Avoid Agricultural Operations)**. The right-of-way would be aligned insofar as practicable to reduce the impact on farm operations and agricultural production.
- **Design Feature 36 (Minimize/Reduce Interference with Agricultural Operations)**. Construction and maintenance activities would be done in a way to minimize impacts on agricultural operations. Soils in these areas would be decompacted or the landowners would be compensated accordingly.

These design features were considered when assessing the level of initial impacts on soils.

Mitigation Planning and Effectiveness

Reclamation seeding methods would include broadcast seeding, drill seeding, or hydroseeding/ hydromulching (or a combination of methods). Seeding methods would be chosen based on the type of seed, disturbance level, soil type, terrain, and precipitation levels for the area to be reclaimed. Seed mixtures and seeding methods would be reviewed and approved by the land-managing agency or private landowner. The Applicant would develop a Reclamation, Revegetation, and Monitoring Plan Framework identifying reclamation stipulations and would incorporate the plan into its POD. The Applicant may use soil amendments (e.g., fertilizer, wood or straw mulches, tackifying agents, or soil-stabilizing emulsions) as needed to ensure reclamation success.

In addition, the Applicant would prepare a SWPPP and an erosion and sediment control plan (ESCP) containing BMPs to control soil erosion, by both water and wind, caused by ground-disturbing activities during construction and operations. The SWPPP and ESCP would identify areas with critical erosion conditions that may require special construction activities or additional BMPs to minimize soil erosion and would be modified as needed to account for changing construction conditions and schedules. As part of the SWPPP and ESCP, temporary and permanent BMPs would be used to control erosion, sediment, and other pollutants associated with construction-related activities. BMP structures would be installed and maintained until disturbed areas meet final stabilization criteria. Damaged temporary erosion and sediment control structures would be repaired in accordance with the SWPPP and ESCP.

On completion of construction, permanent erosion and sediment BMPs would be implemented in accordance with the SWPPP and ESCP. Final cleanup would ensure all construction areas are free of construction debris, including assembly scrap metals, oil or other petroleum-based liquids, construction wood debris, and worker-generated litter. Permanent erosion control devices would be left in place.

In addition to the design features of the B2H Project for environmental protection (refer to Table 2-7),selective mitigation measures would be applied in areas of potential high and moderate (initial) impacts on soils, where feasible, to reduce impacts. The measures applicable to soils are described in this section.

- ***Mitigation Measure 1 (Limit Widening of Existing Roads in Areas of Sensitive Soils and Vegetation)***. In areas where soils and vegetation are sensitive to disturbance, existing roads to be used for construction access and/or B2H Project maintenance would not be widened or otherwise upgraded except in areas needed to make existing roads passable and safe. The potential for increased erosion and sedimentation as a result of soil compaction and/or decompaction would be reduced as well as the loss of soil-stabilizing vegetation. Also, following existing land contours and terrain minimizes the cut and fill of slopes, which reduces the potential for water erosion.
- ***Mitigation Measure 2 (Use Existing Access and/or Crossing for Sensitive Resources Avoidance)***. Existing access and/or crossing would be used for construction and maintenance to avoid disturbance of sensitive resources crossed by the B2H Project. Minimizing ground-disturbing construction activities in the vicinity of surface waters would limit soil disturbance, thereby minimizing the potential for increased erosion and sedimentation.
- ***Mitigation Measure 4 (Minimize Slope Cut and Fill for Access and Work Areas)***. The alignment of new access roads would follow the landform contours where practicable to minimize ground disturbance and/or reduce scarring of the landscape. Minimizing slope cut and fill reduces ground disturbance and potential habitat fragmentation. Water runoff is less likely to accelerate soil erosion, thus minimizing potential damage from rutting and drilling.
- ***Mitigation Measure 6 (Limit New or Improved Accessibility to Areas Previously Inaccessible)***. In areas of sensitive habitat or areas sensitive to additional public access, new or improved access in the B2H Project area would be limited. Most new or improved access would be closed or rehabilitated (in consultation with the landowner or land-managing agency) using the most effective and least environmentally damaging methods appropriate to each area. The closing of these access roads after construction would limit public access to wildlife populations; reduce stress and disturbance to wildlife and special-status wildlife habitats during critical life-cycle periods; and reduce traffic, consequently reducing erosive attributes (e.g., soil compaction, decompaction, and rutting).
- ***Mitigation Measure 8 (Span and/or Avoid Sensitive Features)***. Within the limits of standard tower design, structures would be located to allow conductors to avoid identified sensitive features, such as dwellings/buildings, and span sensitive existing land uses, natural features, and cultural resource sites. Flexibility in the placement of towers allows sensitive features to be avoided. Realigning the towers along an alternative route or realigning the alternative route (micro-siting), to the extent practicable, can result in avoiding or minimizing direct and indirect effects on land uses (e.g., agriculture).
- ***Mitigation Measure 14 (Overland Access)***. In addition to using overland travel in work areas, overland access to work areas may be used to reduce impacts on soils. Overland access would avoid or minimize removal of surface soil and vegetation where soils are susceptible to wind and water erosion, reducing the potential for erosion and loss of habitat.

Activities within the right-of-way, laydown, and staging yards, as well as other areas of extensive vehicle travel and material storage, could cause compacted soils. These soils would be decompacted in some areas, as directed by the agencies or private landowner.

Reclamation seeding methods would include broadcast seeding, drill seeding, or hydroseeding/ hydromulching (or a combination of methods). Seeding methods would be chosen based on the type of seed, disturbance level, soil type, terrain, and precipitation levels for the area to be reclaimed. Seed mixtures and seeding methods would be reviewed and approved by the land-managing agency or private landowner. The Applicant would develop a Reclamation, Revegetation, and Monitoring Plan Framework identifying reclamation stipulations and would incorporate the plan into its POD. The Applicant may use soil amendments (e.g., fertilizer, wood or straw mulches, tackifying agents, or soil-stabilizing emulsions) as needed to ensure reclamation success.

Residual Impacts

Table 3-6 summarizes the initial impacts (based on the intensity of potential effects) on soils, the selective mitigation measures applied to mitigate potentially adverse impacts on soil resources, and residual impacts.

Table 3-6. Summary of Initial and Residual Impacts on Soils

Soils	Initial Impact	Selective Mitigation Measures Applied	Residual Impact
Soils with high susceptibility to water and wind erosion on slopes greater than 15 percent (access levels 2, 5, and 6)	High	1, 2, 4, 6, 14	Low
Soils with high susceptibility to water and wind erosion on slopes between 0 and 15 percent (access levels 3 and 4)	Moderate	1, 2, 4, 14	Low
Soils designated Prime Farmland (based on range of slopes identified for access levels 2, 4, 5, and 6)	High	1, 2, 8	Low
Soils designated Prime Farmland for access level 2)	Moderate	1, 2, 8	Low
Soils with moderate compaction (28 percent or greater clay content) (based on range of slopes identified for access levels 2, 3, 4, and 5)	Moderate	1, 6	Low
Soils with moderate susceptibility to water and wind erosion on slopes greater than 15 percent (access levels 2, 5, and 6)	Moderate	1, 2, 4, 14	Low
Soils with high susceptibility to water or wind erosion on slopes less than 15 percent (access level 1)	Low	None	Low
Soils with moderate susceptibility to water and wind erosion (based on range of slopes identified for access levels 1, 2, 3, 4, and 6)	Low	None	Low
Soils with low susceptibility to water or wind erosion (based on range of slopes identified for all access levels)	Low	None	Low
Soils designated Prime Farmland (based on range of slopes identified for access level 1)	Low	None	Low

Table Note: Includes the implementation of design features for environmental protection.

Minerals

Assessment of Initial Impacts

The level of potential impacts of the B2H Project on minerals that could result from implementation of the B2H Project is used for assessing initial impacts on minerals. Based on the level of potential effects on minerals, initial impacts were assigned using the criteria presented in Table 3-3 and are presented in Table 3-7.

Before construction, the Applicant would call each state's utility locating services so that buried utilities, including oil- and gas-gathering lines and pipelines, could be avoided. Implementation of these measures would avoid adverse effects on mineral exploration and development during the short-term construction period. The Applicant would be required to coordinate with the operators of active mineral operations and to compensate for any loss of access to mineral operations.These design features were considered when assessing the level of initial impacts on soils.

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection (refer to Table 2-7), selective mitigation measures would be applied in areas of potential high and moderate (initial) impacts on minerals, where feasible, to reduce impacts. In particular, Selective Mitigation Measure 8 (Span or Avoid Sensitive Features) also would be used to mitigate impacts on mineral resources (refer to Table 2-13).

Residual Impacts

Table 3-7 summarizes the initial impacts (based on the intensity of potential effects) on minerals, the selective mitigation measures applied to mitigate potentially adverse impacts on minerals, and residual impacts.

Table 3-7. Summary of Initial and Residual Impacts on Minerals

Mineral Resource	Initial Impact	Selective Mitigation Measures Applied	Residual Impacts
Active mines, producers, and active mining claims	High	4	Low
Producing oil and gas or geothermal wells	High	4	Low
All leases	Moderate	None	Moderate

Paleontological Resources

Assessment of Initial Impacts

The level of potential impacts of the B2H Project on paleontological resources that could result from implementation of the B2H Project is used for assessing initial impacts on paleontological resources. Based on the level of potential effects on paleontological resources, initial impacts were assigned using the criteria presented in Table 3-4 and are presented in Table 3-8.

The loss of paleontological resources due to ground-disturbing activities resulting from implementation of the B2H Project would be the primary potential adverse environmental effect. As a design feature of the B2H Project, a Paleontological Resources Treatment Plan (PRTP) would be developed in

consultation with the appropriate land-managing agencies to mitigate potential adverse effects on paleontological resources. The PRTP would include requirements for the following:

(1) A preconstruction survey, by a permitted paleontologist, to describe and record paleontological resources and collect significant paleontological resources exposed on the surface

(2) The monitoring of ground-disturbing activities during construction to collect significant paleontological resources, including microvertebrates, found below the surface

(3) An Unanticipated Discovery Plan that specifies what steps would be taken if a subsurface fossil is discovered during construction, including stopping construction in the vicinity of the find, notifying the appropriate land-managing agency, contacting a qualified paleontologist to conduct an evaluation of the find, developing an approved data recovery program or other mitigation measures, and curating and preparing any significant paleontological resources collected

(4) The minimizing of unauthorized collection of paleontological resources; to meet this requirement, all B2H Project workers would attend mandatory training on the importance of paleontological resources and the relevant federal regulations that protect them

(5) The deposition and appropriate preparation of significant paleontological resources into a federally approved repository for future scientific study and education

Also, pursuant to the requirements of IM 2009-011 (BLM 2009b), preconstruction field surveys would be conducted in areas of PFYC rankings of 4 or higher to identify areas that should be avoided if possible or areas that would require construction monitoring to protect paleontological resources during the construction period. The Applicant would consult with the BLM on areas with a PFYC ranking of 3 to determine whether field surveys would be required. All paleontological resources work conducted for the B2H Project would be performed by qualified paleontologists that are permittable by federal and state agencies.

These design features were considered when assessing the level of initial impacts on paleontological resources.

Mitigation Planning and Effectiveness

In addition to the PRTP (described in the previous section), Selective Mitigation Measure 8 (Span or Avoid Sensitive Features) also would be used to help mitigate impacts on paleontological resources where high or moderate impacts are predicted if not mitigated. Refer to Table 3-9 for rock formations crossed by the paleontological resources study corridor for the B2H Project.

Table 3-8 summarizes the initial impacts (based on the intensity of potential effects) on paleontological resources, the selective mitigation measures applied to mitigate potentially adverse impacts on paleontological resources, and residual impacts.

Table 3-8. Summary of Initial and Residual Impact Levels on Paleontological Resources			
Resource	**Initial Impact**	**Selective Mitigation Measures Applied**	**Residual Impact**
Potential Fossil Yield Classification 4 and 5	High	8	Low[1]
Potential Fossil Yield Classification 3	Moderate	8	Low[1]
Potential Fossil Yield Classification 1 and 2	Low	None	Low
Table Note: [1]Includes effects of PRTP			

3.2.1.5 AFFECTED ENVIRONMENT

This section describes the existing condition of the environment as it pertains to earth resources that could be affected by implementing the B2H Project.

GEOLOGIC HAZARDS

Earthquakes

The B2H Project crosses areas where earthquakes have occurred and could occur in the future. The historical earthquake epicenters and Quaternary faults within the geographical hazards study corridor are shown on MV-2. The Quaternary fault analysis identifies several fault systems with movement over long geologic time periods, suggesting that future movement is possible. On active faults in Union County, the East Grande Ronde Valley fault system has been active in the last 15,000 years, with other movement dating back to 1.6 million years ago. Portions of the West Grande Ronde Valley fault system are active but also contain evidence of movement 130,000 years ago. The Halfway-Posey Valley Section of the Pine Mountain Graben fault system in Baker County (Oregon) is active, with additional movement approximately 750,000 years B.P. The Powder River Peninsula fault system in Baker County and in Washington County (Idaho) is considered active. Malheur County (Oregon) contains the active Cottonwood Mountain Fault and the Juniper Mountain Fault, both of which have had movement within the past 15,000 years. Lastly, the Rush Peak fault zone in Washington County (Idaho) contains recent movement, as well as movement dating back to 1.6 million years ago.

Landslides

Landslides, including mudflows, mudslides, rock flows, rockslides, and debris flows, could occur in the geologic hazards study corridor. A landslide is described as an en masse downward and outward movement of a relatively dry body of rock and/or surficial material in response to gravitational stresses. A mudflow is the downward movement of mud in a mountain watershed because of peculiar characteristics of extremely high sediment yield and occasional high runoff. A mudslide (also called debris flow) is a moving mass of loose sand, soil, rock, water, and air that travels down a slope under the influence of gravity. A rock flow, or fall, is abrupt movements of masses of geologic materials, such as rocks and boulders that become detached from steep slopes or cliffs. (Colorado Geological Survey 2016; USGS 2013) MV-2 shows the landslide hazard zones, mapped by Oregon's DOGAMI, in the B2H Project area in Oregon.

Floodzones

The B2H Project crosses numerous floodzones that have moderate to high susceptibility to flooding. Floodzones, or flood hazard areas as defined by FEMA, are areas that have a 1 percent chance of being inundated in any given year (base flood), areas between the base flood and the 0.2 percent chance of a flood (500 year flood), and those areas with a 0.2 percent annual chance of a flood (FEMA 2016). Most of these floodzones are associated with streams, rivers, lakes, and reservoirs.

SOILS

The B2H Project crosses several major soil orders. The Mollisol soil order constitutes approximately 67 percent of the soils in the soil resources study corridor. The Mollisol soil order includes a variety of soils formed mainly under grasslands; it is the predominant order in northeastern Oregon. These soils have a strong organic component formed by the decomposition of grass and other vegetation, which results in very productive soils.The soil resources study corridor, which includes and the Colombia Plateau, Blue Mountains, the Owyhee Uplands and Snake River Plain physiographic provinces, also consists of soils of the Aridisol order. Aridisols constitute approximately 21 percent of the soils in the soil resources study corridor. Aridisols are found in dry climates and contain subsurface horizons in which clay, calcium carbonate, silica, salts, and/or gypsum have accumulated. They are usually not suitable for agriculture unless irrigation water is provided. Revegetation in these areas may be more difficult due to a lack of water.

The remaining soil orders include Entisols and Andisols, which make up the remaining approximately 12 percent of the soils in the soil resources study corridor. Entisols are soils that show little or no evidence of pedogenic horizon development, and occur in areas of recently deposited parent materials or in areas where erosion or deposition rates are faster than the rate of soil development. The order Andisol is represented by a variety of soils with a predominantly volcanic or volcanoclastic origin. In the soil resources study corridor, the Andisols are predominantly found under coniferous forest vegetation within the Blue Mountains. However, Andisols are sometimes cleared of forest and are used for agriculture.

Erodible Soils

A soil's potential to erode due to water runoff is measured by its *K* factor. The *K* factor is used in the Universal Soil Loss equation and represents a relative index of susceptibility of bare, cultivated soil to particle detachment and transport by rainfall. The DOE Pacific Northwest National Laboratory online guideline (Strelile et al. 1996) identifies low, moderate, and high *K* factor values. Higher *K* factor values indicate higher susceptibility to erosion. Low *K* factor values range from 0.05 to 0.15, moderate *K* factor values range from 0.16 to 0.4, and high *K* factor values exceed 0.4. Because the highest *K* factor value in the NRCS GIS data file was 0.37, that value, rather than 0.4, was used as the high *K* factor value threshold in this EIS. Soil Resources are displayed in MV 3.

The measure of a soil's susceptibility to erosion by wind is the WEG. The NRCS data for WEG were reviewed for the soil resources study corridor. Soils in groups 1 through 4 (greater than or equal to 86

tons per acre per year) were considered highly wind erodible. Highly wind erodible soils were expressed as a percentage of the total soil resources study corridor. The construction and operations disturbance areas also were reviewed to assess the acres of highly wind erodible soil for the B2H Project.

Reclamation Potential of Soils

A stony-rocky soil typically has a percentage of soil particles greater than 3 inches. A droughty soil is a soil with higher percentage of sand or coarse texture and is regarded as having a drainage class that is moderately to excessively well drained. Although all soil is susceptible to compaction to varying degrees, wet soil is more readily compacted than dry soil, and clay loam or finer soil with poor drainage characteristics is assumed to be more highly compaction prone. All soils with clay content of 28 percent or greater were considered to have compaction potential. The presence of stony or rocky soils, droughty soils, or soils prone to compaction, or a combination of these soils, could complicate revegetation efforts.

MINERALS

The B2H Project area includes a variety of potential mineral assets, including salable minerals (sand, gravel, building stones, etc.), locatable minerals (gold, silver, copper, mercury, etc.), and industrial minerals, and semiprecious gemstones (jasper, opal, agate, etc.). Active oil and gas leases are present near Baker and in Malheur County. Baker County has a rich history of placer and lode- type gold and similar locatable mineral deposits, as do the Owyhee Mountains of southwestern Idaho and southeastern Oregon. Much of the general B2H Project vicinity also has favorable conditions for geothermal development, and there is one active geothermal plant in Malheur County within 1 mile of the Proposed Action. Recent exploration in the vicinity of Payette, Idaho, and Ontario, Oregon, suggests that land within the mineral resources study corridor also may hold reserves of oil and natural gas. Salable minerals—including sand and gravel, building stones, and the like—are found throughout the mineral resources study corridor. Mineral resources are shown in MV 4.

PALEONTOLOGICAL RESOURCES

The geological units crossed by the B2H Project and their PFYC are shown in Table 3-9.

Table 3-9. Geologic Units and Their Potential Fossil Yield Classification within the Paleontological Resources Study Area

Geologic Unit Name	Potential Fossil Yield Classification
Quaternary alluvium (Qal)	2
Quaternary alluvial fan debris, slope wash, colluvium, and talus (Qf)	2
Quaternary glacial deposits (Qg)	2
Quaternary glaciofluvial, lacustrine, and pediments/includes Missoula (Qgs)	2
Quaternary landslide and debris flow deposits (Qls)	2
Quaternary lacustrine and fluvial deposits/includes Estacada Formation (Qs)	3
Quaternary terrace, pediment and lag gravels (Qt)	2
Quaternary and Tertiary basalt (QTb)	1

Table 3-9. Geologic Units and Their Potential Fossil Yield Classification within the Paleontological Resources Study Area

Geologic Unit Name	Potential Fossil Yield Classification
Quaternary and Tertiary terrace gravels (QTg)	2
Quaternary and Tertiary sedimentary/lacustrine, tuffaceous sandstone and siltstone/includes Walter Hill, Springwater, and Glenns Ferry formations in Idaho (QTs)	5
Quaternary and Tertiary mafic vent deposits (QTvm)	1
Miocene tuffaceous sedimentary rocks, tuffs, pumicites/includes Mascall Formation, Sucker (Succor) Creek Formation, rocks of Miocene age, Drip Springs Formation, and Trout Creek Formation (Tts)	5
Miocene welded tuffs and tuffaceous sedimentary rocks (Twt)	3
Tertiary andesite, dacite, and sedimentary rocks/includes Alvord Creek Formation (Tas)	2
Tertiary silicic ash-flow tuff/includes Rattlesnake tuff (Tat)	4
Tertiary basalt (Tb)	1
Tertiary basalt/includes Steens basalt, Owyhee basalt, some sedimentary (Tba)	2
Columbia River Basalt Group (Tc)	2
Tertiary clastic rocks and andesite flows/includes Clarno Formation, some sedimentary (Tca)	3
Grande Ronde Basalt/N2 magnetostratigraphic unit (Tcg)	2
Imhaha basalt (Tci)	1
Picture Gorge basalt (Tcp)	1
Saddle Mountain basalt (Tcs)	1
Wanapum basalt/ includes Frenchman Springs Member (Tcw)	2
Tertiary mafic and intermediate intrusive rocks (Tim)	1
Tertiary lacustrine and fluvial deposits/includes Deer Butte Formation, Juntura Formation, Spring Creek Tuff, and Leslie Gulch ash flow (Tlf)	4
Tertiary marine sandstone and siltstone/includes Unpqua Formation and Flournoy Formation (Tmss)	2
Tertiary olivine basalt, some sedimentary (Tob)	2
Tertiary pyroclastic eject of basaltic cinder cones (Tp)	1
Tertiary subaqueous pyroclastic ejecta, some sedimentary (Tps)	2
Tertiary rhyolite and dacite domes and flows (Tr)	1
Tertiary ridge-capping basalt and basaltic andesite (Trb)	1
Tertiary rhyolite and dacite/includes Jump Creek Rhyolite and Littlefield Rhyolite (Trh)	1
Tertiary tuffaceous sedimentary rocks/includes Glenns Ferry Formation, Drip Springs Formation, Drewsey Formation, Bully Creek Formation, Dalles Group, Shutler Formation, Kern Basin Formation, Danforth Formation, Idaho Group, Thousand Creek Beds, Madras Formation, Simtustus Formation, Yonna Formation, Sandy River Formation, and Helvetia Formation (Ts)	5
Tertiary rhyolitic tuff, tuffaceous sedimentary rocks, and lava flows/ includes Pike Creek Formation (Tsf)	4
John Day Formation (Tsfj)	5
Strawberry volcanics (Tstv)	1
Tertiary mafic and intermediate vent rocks (Tvm)	1
Tertiary silicic vent rocks (Tvs)	3
Granitic rocks late Cretaceous and early Cretaceous (KJg)	1

Table 3-9. Geologic Units and Their Potential Fossil Yield Classification within the Paleontological Resources Study Area

Geologic Unit Name	Potential Fossil Yield Classification
Intrusive rocks Cretaceous and Jurassic (KJi)	1
Hurwal Formation/sedimentary rocks Jurassic and Triassic (JTRs)	3
Weatherby Formation/sedimentary and volcanic rocks Jurassic and Triassic (JTRsv)	3
Triassic-Jurassic granite and diorite (JTRgd)	1
Triassic volcanic and metavolcanic rocks, some sedimentary (TRv)	3
Triassic sedimentary and volcanic rocks (TRsv)	3
Triassic marine sedimentary rocks/includes Beggs Formation, Brisbois Formation, Vester Formation, Rail Canyon Argillite, Fields Creek Formation, Martin Bridge Formation, Doyle Creek Formation, and Wild Sheep Creek Formation (TRs)`	3
Triassic and Permian marble (TRPzsn)	1
Triassic and Paleozoic sedimentary rocks, partly metamorphosed (TRPzs)	2
Triassic-Permian sedimentary and volcanic rocks, partly metamorphosed (TRPsv)	2
Triassic-Permian volcanic rocks (TRPv)	1
Triassic and Paleozoic ultramafic and mafic intrusive rocks (TRPzu)	1
Mixed rocks sedimentary and volcanic Mesozoic and Paleozoic (mr)	3
Paleozoic gabrroic rocks (TRPzg)	1
Table Source: Ludington et al. 2006	

A review of paleontological features in eastern Oregon indicates that whole and partial fossils have been discovered in the sedimentary rocks from the Miocene, Pliocene, and Pleistocene periods. In the northern portion of the paleontological resources study corridor, the Alkali Canyon and McKay Formations of the Dalles Group are fossiliferous late Miocene to Pliocene sedimentary units often interbedded with basalt (Farooqui et al. 1981). Surface surveys or shallow hand excavations in these units have yielded whole fossils or fragments of fossil mammals, including canines, rodents, and herbivores. Southeast of Boardman, a fossil locality within the Dalles Group is recorded within 2 miles of the Longhorn Alternative. Farther south in Baker and Malheur counties, widely distributed Miocene and Pleistocene sedimentary rocks associated with the Idaho Group also are documented to have a large variety of fossil resources. Fossil evidence includes a variety of plants, insects, turtles, canines, rodents, squirrels, beavers, rhinoceroses, small carnivores, camels, deer, peccaries, mastodons, and mammoths. Shotwell (1970) reported finds of up to 36 different mammal species within sedimentary beds in southeastern Oregon. There are two fossil localities within the Chalk Butte Formation recorded within 2 miles of the Malheur A Alternative. A fossil locality was reported within 0.25 miles of the Malheur S Alternative, but this locality does not name a formation but is Miocene in age. Additionally, Jason McClaughry (personal communication, September 6, 2011), field geologist for the Oregon DOGAMI Baker City office, indicated that mammal fossils recently have been discovered in surface alluvial sediments near the La Grande airport. One fossil locality near La Grande was found in a late Pleistocene alluvial fan and is recorded within 0.7 mile of the Mill Creek Alternative.

BLM Oregon has not designated PFYC values for Oregon bedrock units (J. Zancanella, personal and email communication, April 11, 2011). Therefore, PFYC values for the Oregon bedrock units and Idaho

rocks not appearing on the BLM list have been estimated. A number of factors were used to provide the estimates. For instance, very low (Class 1) to low (Class 2) classifications were assumed for igneous rocks. The Miocene-Pliocene sedimentary rocks in Oregon were classified as high (Class 4) or very high (Class 5). These included most of the sedimentary rocks in Baker and Malheur counties and Dalles Group rocks (McKay and Alkali Canyon Formations) in Umatilla and Morrow counties. These sediments are of similar age and depositional environments to the Idaho bedrock formations (Bruneau, Glenns Ferry, Chalk Hills, etc.) that BLM Idaho rated as high to very high. Other bedrock with unknown fossil potential was classified as Class 3 (moderate or unknown potential).

The paleontology report for the Sunstone Pipeline project, originally planned to pass through Malheur, Baker, Union, and Umatilla counties (Uinta Paleontological Associates 2010) also was reviewed. The report also provided estimates of PFYC. A comparison of the Sunstone Pipeline PFYC and the preliminary Oregon PFYC estimates identified a good correlation. In general, the Holocene and Pleistocene sediments in both reports received a Class 3, and Miocene-Pliocene units received Class 3, 4, or 5 designations. The paleontological review also included interviews with BLM Oregon and state paleontologists and visits to the BLM Vale and Baker City Field Offices to meet staff with paleontology oversight and to review paleontological information (D. Pritchard, personal communication, April 8, 2011). Paleontological resources are shown in MV 5.

The Idaho Group bedrock units in Owyhee County, Idaho, have similar fossil potential to the Idaho Group bedrock in Baker and Malheur counties, Oregon (B. Breithaupt, email communication, December 2, 2011; F. Halford, personal communication, August 31, 2011). In several places, the B2H Project crosses the Poison Creek Formation, which has been identified as highly fossiliferous, of the Idaho Group. This formation has yielded the fossils or fossil fragments of several fish species; turtles; mammals, including rabbits, small carnivores, rhinoceroses, small and large camels, horses, and sloths; and more than 50 species of plants (BLM 2007; Smith et al. 1982).

SEGMENT 1—MORROW-UMATILLA

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-10 presents the miles crossed by geologic hazards for all alternative routes and route variations in Segment 1.

Table 3-10. Geologic Hazards Inventory Data for Segment 1—Morrow-Umatilla						
Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]	
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84
Applicant's Proposed Action	91.9	0.1	0.0	0.0	91.9	0.0
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*	*0.0*
East of Bombing Range Road	92.3	0.1	0.0	0.0	92.3	0.0
Applicant's Proposed Action – Southern Route	99.1	0.1	0.0	0.0	99.1	0.0
West of Bombing Range Road – Southern Route	95.6	0.1	0.0	0.0	95.6	0.0
Longhorn	88.2	0.1	0.0	0.0	88.2	0.0
Interstate 84	84.7	0.1	0.0	0.0	84.7	0.0
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*
Interstate 84 – Southern Route	93.4	0.1	0.0	0.0	93.4	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 1.

No recently active Quaternary faults, or areas with moderate or high landslide potential were identified for the Applicant's Proposed Action Alternative. Eighteen previously reported earthquake epicenters occurred within one mile of the Applicant's Proposed Action Alternative. All of the previously reported earthquakes had recorded magnitudes of less than 6. A cluster of eight of these earthquakes was reported just west of Hermiston Highway 207. Another cluster of six earthquakes have been reported south of Pilot Rock. The Applicant's Proposed Action Alternative crosses three areas of high liquefaction potential—at Boardman, immediately south of Boardman, and near Hermiston Highway 207 where it would cross the Umatilla River. This alternative crosses three areas with a high percentile ranking for floodzones. These occur along the Upper Grande Ronde, Umatilla, and Middle Columbia-Lake Wallula watersheds, and total approximately 10,936 in the geologic hazards study corridor. The alternative also crosses areas of the same watersheds that have a moderate percentile ranking for floodzones having 11,040 acres for the geologic hazards study corridor.

Variations S1-B1 and S1-B2

There are no faults or previously recorded earthquake epicenters crossed by this route variation. The route crosses lands with low landslide potential. This variation crosses no additional acreage for areas with moderate or high percentile ranking for floodzones.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

There are no Quaternary faults or previously recorded earthquake epicenters for the additional action. The additional action does cross an area with moderate liquefaction south of Boardman near Link I-36. The additional action only crosses areas with a low percentile ranking for floodzones.

Soils

Table 3-11 presents the soil resources and their susceptibility to erosion and compaction crossed by the B2H Project in Segment 1. For the soil comparison tables: Unknown signifies no data was available, Low signifies those soils with low susceptibility to wind and water erosion or compaction, and Moderate signifies moderate susceptibility to wind and water erosion or compaction (based on soil types and their characteristics, and access model discussed in Chapter 2).

Table 3-11. Soils Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Applicant's Proposed Action	91.9	8.3	50.9	32.7	0.0	91.6	0.3	89.6	2.3
Variation S1-B1	*6.4*	*0.0*	*3.1*	*3.3*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*4.0*	*2.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*
East of Bombing Range Road	92.3	8.3	52.7	31.3	0.0	92.0	0.3	90.0	2.3
Applicant's Proposed Action – Southern Route	99.1	9.5	58.0	31.6	0.0	98.8	0.3	94.7	4.4
West of Bombing Range Road – Southern Route	95.6	9.5	50.2	35.9	0.0	95.2	0.4	87.9	7.7
Longhorn	88.2	8.3	50.4	29.5	0.0	80.9	7.3	85.9	2.3
Interstate 84	84.7	8.3	57.7	18.7	0.0	78.8	5.9	82.4	2.3
Variation S1-A1	*18.5*	*0.0*	*16.3*	*2.2*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*5.9*	*12.6*	*0.0*	*18.3*	*0.2*	*18.5*	*0.0*
Interstate 84 – Southern Route	93.4	9.5	66.1	17.8	0.0	87.5	5.9	89.0	4.4

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resources.

No soils with high susceptibility to water or wind erosion are crossed by the Applicant's Proposed Action Alternative. The alternative does cross 32.7 miles of soils with moderate susceptibility to water erosion and 0.3 mile of soils with moderate susceptibility to wind erosion. The alternative crosses 2.3 miles of soils with high compaction potential. Droughty soils also are present throughout the alternative route study corridor particular in the vicinity of Boardman, east of Hermiston Highway, and south and east of Pilot Rock. Stony/rocky soils are crossed east of Hermiston Highway and south and east of Pilot Rock.

Variation S1-B1

This variation crosses 3.3 miles of soils with moderate susceptibility to water erosion. This variation does not cross soils with compaction potential. This variation does not cross any droughty or stony soils.

Variation S1-B2

This variation crosses 2.4 miles of soils with moderate susceptibility to water erosion. This variation does not cross any prime farmlands or soils with compaction potential. This variation does not cross any droughty or stony soils.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The additional action does not cross any soils with high susceptibility to wind or water erosion, but does cross areas with moderate susceptibility to wind erosion. The additional action also crosses an area with drought soils near Boardman.

Minerals

Table 3-12 presents the mineral resources crossed by the B2H Project in Segment 1.

Table 3-12. Minerals Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Active Mine or Active Mining Claims	All Leases	Producing Oil and Gas or Geothermal Wells
Applicant's Proposed Action	91.9	0.0	0.0	0.0
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	2.0	0.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	0.0
West of Bombing Range Road – Southern Route	95.6	0.0	0.5	0.0
Longhorn	88.2	0.0	2.9	0.0
Interstate 84	84.7	0.0	0.4	0.0
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	0.4	0.0

Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

No mineral resources are crossed by the Applicant's Proposed Action Alternative or Variations S1-B1 and S1-B2.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The additional action does not cross any mineral resources.

Paleontological Resources

Table 3-13 presents information on the paleontological resources crossed by the B2H Project in Segment 1.

Table 3-13. Paleontological Resources Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)				
		1	2	3	4	5
Applicant's Proposed Action	91.9	0.0	61.3	10.8	19.8	0.0
Variation S1-B1	*6.4*	*0.0*	*6.4*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*6.4*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	61.3	10.8	20.2	0.0
Applicant's Proposed Action – Southern Route	99.1	0.0	72.1	10.8	16.2	0.0
West of Bombing Range Road – Southern Route	95.6	0.0	71.4	10.8	13.4	0.0
Longhorn	88.2	0.0	61.3	13.2	13.7	0.0
Interstate 84	84.7	0.0	58.2	22.9	3.6	0.0
Variation S1-A1	*18.5*	*0.0*	*12.6*	*5.9*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*14.0*	*4.5*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	70.5	22.9	0.0	0.0

The Applicant's Proposed Action Alternative crosses 19.8 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 10.8 miles with a moderate sensitivity (PFYC 3) for paleontological resources. No geologic units with very high sensitivity (PFYC 5) are crossed by the Applicant's Proposed Action Alternative.

No geologic units with very high, high, or moderate sensitivity for paleontological resources are crossed by Variations S1-B1 and S1-B2.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The additional action crosses geologic units with moderate and high sensitivity for paleontological resources.

East of Bombing Range Road Alternative

Geologic Hazards

No recently active Quaternary faults, or areas with moderate or high landslide potential are crossed by the East of Bombing Range Road Alternative (Table 3-10). Thirteen historic earthquake epicenters are located within one mile of the reference centerline, including the same cluster of epicenters located just east of Hermiston Highway 207 (Link I-45) and in the study corridor for the Applicant's Proposed Action Alternative. The East of Bombing Range Road Alternative crosses one area of instability that also is crossed by the Applicant's Proposed Action Alternative. This is located west of Link I-45. This alternative crosses the same three areas with a high percentile ranking for floodzones as crossed by the West of Bombing Range. This alternative crosses one area with a high percentile ranking for floodzones. This occurs along the Umatilla watershed and totals approximately 575 acres in the

geologic hazards study corridor. The alternative also crosses same watershed with areas having a moderate percentile ranking for floodzones having 1,998 acres for the geologic hazards study corridor.

Soils

No soils with high susceptibility to water or wind erosion are crossed by the alternative (Table 3-11). The alternative crosses 31.3 miles of soils with moderate susceptibility to water erosion and 0.3 mile of soils with moderate susceptibility to wind erosion. The alternative crosses 2.3 miles of soils with high compaction potential.

Similar to the Applicant's Proposed Action Alternative, droughty soils are present throughout the study corridor for the East of Bombing Range Road Alternative, particularly in the vicinity of Boardman and east of Hermiston Highway, and south and east of Pilot Rock. Stony/rocky soils occur east of Hermiston Highway. Also, stony/rocky soils are crossed east of Hermiston Highway but this route does not cross the stony/rocky soils south of Pilot Rock.

Minerals

The East Bombing Range Road Alternative crosses 2.0 miles of existing minerals leases near Boardman. No active mine or mining claims or producing oil, gas, or geothermal wells are crossed.

Paleontological Resources

The alternative route crosses 20.2 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 10.8 miles with a moderate sensitivity (PFYC 3) for paleontological resources. No geologic units with very high sensitivity (PFYC 5) are crossed by the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Geologic Hazards

No recently active Quaternary faults, or areas with moderate or high landslide potential are crossed by the Applicant's Proposed Action – Southern Route Alternative (Table 3-10). Seventeen historic earthquakes are located within 1.0 mile of the reference centerline. All of the previously reported earthquakes had recorded magnitudes of less than 6. A cluster of eight of these earthquakes occurred east of Highway 207 (Link I-45); another six earthquakes occurred south of Pilot Rock along Link I-64. The Applicant's Proposed Action – Southern Route Alternative crosses 7 areas of high liquefaction potential—at Boardman, immediately south of Boardman, and scattered areas in the study corridor where it crosses streams. This alternative crosses one area with a high percentile ranking for floodzones. This occurs along the Umatilla watersheds and totals approximately 575 acres in the geologic hazards study corridor. The alternative also crosses an area of the same watershed having moderate percentile ranking for floodzones with 1,212 acres for the geologic hazards study corridor.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

There are no Quaternary faults or previously recorded earthquakes for the additional action. The additional action does cross an area with moderate liquefaction potential near Boardman. The additional action only crosses areas with a low percentile ranking for floodzones.

Soils

There were no soils with high susceptibility to water or wind erosion identified for the alternative route. The alternative route does cross 31.6 miles of soils with moderate susceptibility to water erosion and 0.3 mile of soils with moderate susceptibility to wind erosion. The alternative route also crosses 4.4 miles of soils with high compaction potential. Droughty soils, identified, were scattered throughout most of this alternative route except for the area around Highway 207. Soils that were identified as stony/rock do not occur until after Highway 207 but, from that point forward, occur sporadically throughout rest of the alternative to the terminus of Segment 1.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The additional action does not cross any soils with high susceptibility to wind or water erosion, but does cross areas with moderate susceptibility to wind erosion. The additional action also crosses an area with drought soils near Boardman

Minerals

No mineral resources were identified for this alternative route.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The additional action does not cross any mineral resources

Paleontological Resources

The alternative route crosses 16.2 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 10.8 miles with a moderate sensitivity (PFYC 3) for paleontological resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The additional action does cross geologic units with moderate and high sensitivity for paleontological resources.

West of Bombing Range Road – Southern Route Alternative

Geologic Hazards

No recently active Quaternary faults, or areas with moderate or high landslide potential were identified for the alternative route. There are 11 previously reported earthquake epicenters within one mile of the alternative route, all of which have recorded magnitudes of less than 6. A cluster of six of these

earthquakes was reported south of Pilot Rock near Link I-64. The alternative route crosses eight areas of high liquefaction potential; at Boardman, immediately south of Boardman, and scattered areas throughout the alternative where it crosses streams. This alternative crosses the same floodzone as the West of Bombing Range Alternative and their total acres.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The impacts on geologic hazards are the same as the Applicant's Proposed Action Alternative.

Soils

There were no soils with high susceptibility to water or wind erosion identified for the alternative route. The alternative route does cross 35.9 miles of soils with moderate susceptibility to water erosion and 0.4 mile of soils with moderate susceptibility to wind erosion. The alternative route also crosses 15.1 miles of prime or unique farmland, and 7.7 miles of soils with high compaction potential. Droughty soils, identified, were scattered throughout the alternative route. However, concentrations of droughty soils occur in and around the Boardman area, east of Highway 207, and south of Pilot Rock. Soils that were identified as stony/rock are scattered throughout this alternative beginning east of Highway 207

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The impacts on soils would be the same as the Applicant's Proposed Action Alternative.

Minerals

The West of Bombing Range Road Southern Route Alternative crosses 0.5 mile of leases near Boardman, and between highways 207 and 74.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The impact on mineral resources would be the same as the Applicant's Proposed Action Alternative.

Paleontological Resources

The alternative route crosses 3.4 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 10.8 miles with a moderate sensitivity (PFYC 3) for paleontological resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The impact on paleontological resources would be the same as the Applicant's Proposed Action Alternative.

Longhorn Alternative

Geologic Hazards

The Longhorn Alternative does not cross any recently active Quaternary faults or any areas with moderate or high landslide susceptibility. There are 13 earthquake epicenters within the geologic

hazards study corridor for this alternative with a concentration of them just east of Highway 207. All of these previously recorded earthquakes had a magnitude of less than 6. This alternative crosses 7 areas with high liquefaction potential. These occur in the Boardman area and scattered throughout the alternative near streams that are within the geologic hazards study corridor. This alternative crosses one area with a high percentile ranking for floodzones. This occurs along the Umatilla watershed and totals approximately 1,998 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 575 acres for the geologic hazards study corridor.

Soils

This alternative crosses 29.5 miles of soils with moderate susceptibility to water erosion and 7.3 miles of soils with moderate susceptibility to wind erosion. In addition, droughty soils are found scattered throughout the alternative, but have concentrations in the Boardman area, and east of Pilot Rock. Stony/rocky soils are found along this alternative east of Highway 207 and between Pilot Rock and I-84.

Minerals

This alternative crosses 2.9 miles of leases southeast of Boardman.

Paleontological Resources

This alternative crosses 13.7 miles of geologic units with a high sensitivity (PFYC of 4), and 13.2 miles of geologic units with a moderate sensitivity (PFYC of 3).

Interstate 84 Alternative

Geologic Hazards

This alternative crosses no Quaternary faults with recent activity. There are eight previously recorded earthquake epicenters within the geologic hazards study corridor for this alternative. All of these had a recorded magnitude of less than 6. This alternative crosses two areas that were identified as having very high liquefaction potential. These were located near Stanfield(Link I-31) and just west of Pendleton. In addition there are five areas with moderate liquefaction potential. Most of these are scattered throughout the alternative, but a large area of high liquefaction exists from Boardman to Stanfield. This alternative crosses one area with a high percentile ranking for floodzones. This occurs along the Umatilla watershed and totals approximately 6,015 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed having a moderate percentile ranking for floodzones with 6,198 acres for the geologic hazards study corridor.

Variation S1-A1

There are two earthquake epicenters previously reported for this variation. This variation has one area, west of Pendleton, with very high liquefaction potential. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Umatilla watershed and total approximately 1,087 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 4,342 acres for the geologic hazards study corridor.

Variation S1-A2

This variation has three previously reported earthquake epicenters. The variation crosses one area of very high liquefaction near Stanfield, and one area with high liquefaction potential, south of Stanfield. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Umatilla watershed and total approximately 4,544 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 2,505 acres for the geologic hazards study corridor.

Soils

This alternative crosses 18.7 miles of soils with moderate susceptibility to water erosion and 5.9 miles of soils with moderate susceptibility to wind erosion. In addition, droughty soils are found scattered throughout the alternative, but have concentrations in the Boardman area, near Pendleton, and east of Pilot Rock. Stony/rocky soils are found along this alternative near Pendleton and east of Pilot Rock. This alternative also crosses 2.3 miles of soils with high compaction potential.

Variation S1-A1

This variation crosses 2.2 miles of soils with moderate susceptibility to water erosion and 0.0 mile of soils with moderate susceptibility to wind erosion. In addition, this variation crosses 0.7 mile of farmlands and 0.0 mile of soils with high compaction potential. This variation also crosses small areas of droughty soils east of Stanfield, and stony/rocky soils west of Pendleton.

Variation S1-A2

This variation crosses 12.6 miles of soils with moderate susceptibility to water erosion and 0.2 mile of soils with moderate susceptibility to wind erosion. In addition, this variation crosses 3.6 miles of farmlands and 0.0 mile of soils with high compaction potential. This variation has a concentration of droughty and stony/rocky soils west of Pendleton.

Minerals

Interstate 84 Alternative crosses 0.4 mile of leases and Variations S1-A1 and S1-A2 do not across any mineral resources.

Paleontological Resources

Interstate 84 Alternative crosses 3.6 miles of geologic units with a high sensitivity (PFYC of 4) and 22.9 miles of geologic units with a moderate sensitivity (PFYC of 3).

Variation S1-A1

This variation crosses 4.5 miles of geologic units with a PFYC of 3.

Variation S1-A2

This variation crosses 5.9 miles of geologic units with a PFYC of 3.

Interstate 84 – Southern Route Alternative

Geologic Hazards

This alternative crosses 14 previously recorded earthquake epicenters, all of which had a magnitude of less than 6. The alternative also crosses two areas of very high liquefaction potential east of Stanfield and two areas of high liquefaction potential between Boardman and Stanfield. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Umatilla watershed and total approximately 6,015 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 5,412 acres for the geologic hazards study corridor.

Soils

This alternative crosses 17.8 miles of soils with moderate susceptibility to water erosion and 5.9 miles of soils with moderate susceptibility to wind erosion. This alternative also crosses 4.6 miles of farmlands and 4.4 miles of soils with high compaction potential. In addition, droughty soils were identified east of Boardman, west of Pendleton, and east of Pilot Rock. Stony/rocky soils were identified west of Pendleton and east of Pilot Rock.

Minerals

This alternative crosses 0.4 mile of leases.

Paleontological Resources

This alternative crosses 22.9 miles of geologic units with a moderate sensitivity (PFYC of 3).

SEGMENT 2—BLUE MOUNTAINS

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-14 presents the miles crossed by geologic hazards for all alternative routes and route variations in Segment 2.

Table 3-14. Geologic Hazards Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)	
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84
Applicant's Proposed Action	33.8	0.0	0.0	0.0	33.8	0.0
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*2.9*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*3.7*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*3.8*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*9.3*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*8.8*	*0.0*

Table 3-14. Geologic Hazards Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)	
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*2.3*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*2.6*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*12.1*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*12.2*	*0.0*
Glass Hill	33.7	0.0	0.0	0.0	33.7	0.0
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*4.3*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*4.1*	*0.0*
Mill Creek	34.0	0.0	0.0	1.0	34.0	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 2.

No recently active Quaternary faults, or areas with moderate or high landslide potential were identified for the Applicant's Proposed Action Alternative. No previously reported earthquake epicenters occurred within one mile of the Applicant's Proposed Action Alternative. The Applicant's Proposed Action Alternative crosses one large area of high liquefaction potential—along Links 2-52 through 2-85. This alternative crosses one area with a high percentile ranking for floodzones. This occurs along the Upper Grande Ronde watershed and totals approximately 375 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 378 acres for the geologic hazards study corridor.

Variation S2-A1

This variation crosses no Quaternary faults or areas with moderate or high landslide susceptibility. There are no previously reported earthquake epicenters for this variation in the geologic hazards study corridor. This variation does not cross any areas with moderate or high liquefaction potential. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Upper Grande Ronde watershed and totals approximately 77 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 321 acres for the geologic hazards study corridor.

Variation S2-A2

This variation crosses no Quaternary faults or areas with moderate or high landslide susceptibility. There are no previously reported earthquake epicenters for this variation in the geologic hazards study corridor. This variation does not cross any areas with moderate or high liquefaction potential. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Upper Grande Ronde watershed and totals approximately 0.21 acres in the geologic hazards study corridor.

The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 333 acres for the geologic hazards study corridor.

Variation S2-B1

This variation crosses no Quaternary faults or areas with moderate or high landslide susceptibility. There are no previously reported earthquake epicenters for this variation in the geologic hazards study corridor. This variation crosses one area with moderate liquefaction potential. This occurs near La Grande. This variation would not cross any areas with moderate or high percentile for floodzones.

Variation S2-B2

This variation crosses no Quaternary faults or areas with moderate or high landslide susceptibility. There are no previously reported earthquake epicenters for this variation in the geologic hazards study corridor. This variation crosses one area with moderate liquefaction potential. This occurs near La Grande. This variation would not cross any areas with moderate or high percentile for floodzones.

Variations S2-C1, S2-C2, S2-E1, S2-E2, S2-F1, and S2-F2

These variations cross no Quaternary faults or areas with moderate or high landslide susceptibility. There are no previously reported earthquake epicenters for these variations in the geologic hazards study corridor. These variations cross no areas with moderate or high liquefaction potential. This variation would not cross any areas with moderate or high percentile for floodzones.

Soils

Table 3-15 presents the miles crossed by soil resources and their susceptibility to erosion and compaction for all alternative routes and route variations in Segment 2.

Table 3-15. Soils Inventory Data for Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Applicant's Proposed Action	33.8	9.9	19.6	4.3	0.1	33.7	0.0	29.9	3.9
Variation S2-A1	*2.8*	*0.3*	*2.3*	*0.2*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*
Variation S2-A2	*2.9*	*0.2*	*2.2*	*0.5*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*
Variation S2-B1	*3.7*	*2.0*	*1.5*	*0.2*	*0.0*	*3.7*	*0.0*	*3.5*	*0.2*
Variation S2-B2	*3.8*	*1.9*	*1.6*	*0.3*	*0.0*	*3.8*	*0.0*	*3.6*	*0.2*
Variation S2-C1	*9.3*	*5.6*	*2.4*	*1.3*	*0.0*	*9.3*	*0.0*	*7.8*	*1.5*
Variation S2-C2	*8.8*	*5.1*	*3.5*	*0.2*	*0.0*	*8.8*	*0.0*	*7.9*	*0.9*
Variation S2-E1	*2.3*	*0.8*	*1.5*	*0.0*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*
Variation S2-E2	*2.6*	*0.6*	*1.9*	*0.1*	*0.0*	*2.6*	*0.0*	*2.3*	*0.3*
Variation S2-F1	*12.1*	*0.1*	*9.9*	*2.1*	*0.1*	*12.0*	*0.0*	*9.9*	*2.2*
Variation S2-F2	*12.2*	*0.0*	*11.0*	*1.2*	*0.0*	*12.2*	*0.0*	*10.1*	*2.1*

Table 3-15. Soils Inventory Data for Segment 2—Blue Mountains (miles crossed)									
Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Glass Hill	33.7	9.0	21.5	3.2	0.1	33.6	0.0	31.1	2.6
Variation S2-D1	*4.3*	*3.1*	*0.8*	*0.4*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*
Variation S2-D2	*4.1*	*2.5*	*0.9*	*0.7*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*
Mill Creek	34.0	4.4	26.6	3.0	0.0	34.0	0.0	30.5	3.5

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

No soils with high susceptibility to water or wind erosion are crossed by the Applicant's Proposed Action Alternative. The alternative does cross 4.3 miles of soils with moderate susceptibility to water erosion. The alternative crosses 3.9 miles of soils with high compaction potential. Droughty and stony/rocky soils also are present throughout the alternative route study corridor particular in the vicinity south of La Grande.

Variation S2-A1

This variation crosses 0.2 mile of soils with moderate susceptibility to water erosion. No soils with moderate or high susceptibility to wind erosion, or soils with high compaction potential are crossed by this variation. This variation does cross a small area of droughty and stony/rocky soils near its terminus.

Variation S2-A2

This variation crosses 0.5 mile of soils with moderate susceptibility to water erosion. No soils with moderate or high susceptibility to wind erosion, or soils with high compaction potential are crossed by this variation. This variation does cross a small area of droughty and stony/rocky soils near its terminus.

Variation S2-B1

This variation crosses 0.2 mile of soils with moderate susceptibility to water erosion, and no miles of moderate or high susceptibility to wind erosion. This variation crosses 0.2 mile of soils with high compaction potential. This variation does cross a small area of droughty and stony/rocky soils near La Grande.

Variation S2-B2

This variation crosses 0.2 mile of soils with moderate susceptibility to water erosion. No soils with moderate or high susceptibility to wind erosion, or soils with high compaction potential are crossed by this variation. This variation does cross a small area of droughty and stony/rocky soils near La Grande.

Variation S2-C1

This variation crosses 1.3 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation does cross 1.5 miles of soils with high compaction potential. This variation does cross a small area of droughty and stony/rocky soils near La Grande.

Variation S2-C2

This variation crosses 0.2 mile of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation does cross 0.9 mile of soils with high compaction potential. This variation does cross areas of droughty and stony/rocky soils near La Grande.

Variation S2-E1

This variation does not cross any soils with moderate or high susceptibility to water or wind erosion, or soils with high compaction potential. This variation does cross droughty and stony/rocky soils throughout its length.

Variation S2-E2

This variation crosses 0.1 mile of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation does cross 0.3 mile of soils with high compaction potential. This variation does cross areas of droughty and stony/rocky soils throughout its length.

Variation S2-F1

This variation crosses 2.1 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation does cross 2.2 miles of soils with high compaction potential. This variation does cross areas of droughty and stony/rocky soils throughout its length.

Variation S2-F2

This variation crosses 1.2 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation does cross 2.1 miles of soils with high compaction potential. This variation does cross areas of droughty and stony/rocky soils throughout its length.

Minerals

Segment 2 alternative routes and route variations do not cross any mineral resources.

Paleontological Resources

Table 3-16 presents the miles crossed by paleontological resources for all alternative routes and route variations in Segment 2.

Table 3-16. Paleontological Resources Inventory Data for Segment 2—Blue Mountains						
Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)				
		1	2	3	4	5
Applicant's Proposed Action	33.8	16.7	17.1	0.0	0.0	0.0
Variation S2-A1	*2.8*	*0.0*	*2.8*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*2.9*	*0.0*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*1.2*	*2.5*	*0.0*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*1.6*	*2.2*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*8.4*	*0.9*	*0.0*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*5.8*	*2.1*	*0.9*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.7*	*1.6*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*1.0*	*1.6*	*0.0*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*6.1*	*6.0*	*0.0*	*0.0*	*0.0*
Variation S2-F2	*12.2*	*7.5*	*4.7*	*0.0*	*0.0*	*0.0*
Glass Hill	33.7	15.6	18.1	0.0	0.0	0.0
Variation S2-D1	*4.3*	*4.1*	*0.2*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*4.0*	*0.1*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	19.0	15.0	0.0	0.0	0.0

Variation S2-C2 of the Applicant's Proposed Action Alternative crosses 0.9 mile of geological units with a moderate sensitivity (PFYC of 3). All other variations and alternatives do not cross any geological units with a moderate, high, or very high sensitivity (PFYC 3, 4, and 5).

Glass Hill Alternative

Geologic Hazards

The Glass Hill Alternative would not cross any Quaternary faults or areas with moderate or high landslide susceptibility. There are no previously recorded earthquake epicenters within the geologic hazards study corridor for this alternative. The alternative does cross an area of moderate and high liquefaction potential where it crosses Higgard Highway, and another one along Links 2-52 through 2-85. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Upper Grande Ronde watershed and totals approximately 77 acres in the geologic hazards study corridor. The alternative also crosses areas of the same watershed have a moderate percentile ranking for floodzones having 378 acres for the geologic hazards study corridor.

Variations S2-D1 and S2-D2

These variations do not cross any Quaternary faults or areas with moderate or high landslide susceptibility. There are no previously reported earthquake epicenters, or areas with moderate or high liquefaction potential in the geologic hazard study corridor for these variations. These variations would not cross any areas with moderate or high percentile for floodzones.

Soils

The Glass Hill Alternative crosses 3.2 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation does cross 2.6

miles of soils with high compaction potential. This variation does cross areas of droughty and stony/rocky soils throughout most of its length.

Variation S2-D1

This variation crosses 0.4 mile of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. There are no soils with high compaction potential found for this variation in the soil resources study corridor. Droughty and stony/rocky soils are found through the length of this variation.

Variation S2-D2

This variation crosses 0.7 mile of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. There are no soils with high compaction potential found for this variation in the soil resources study corridor. Droughty and stony/rocky soils are found through the length of this variation.

Minerals

The Glass Hill Alternative and route variations do not cross any mineral resources.

Paleontological Resources

The Glass Hill Alternative and route variations do not cross any geologic units with moderate, high, or very high sensitivity for paleontological resources.

Mill Creek Alternative

Geologic Hazards

The Mill Creek Alternative crosses approximately one mile of recent Quaternary faults. There are no areas of moderate or high landslide susceptibility for this alternative. There are two areas of moderate liquefaction potential for this alternative. These occur near La Grande and near Highway 84. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Upper Grande Ronde watershed and totals approximately 0.21 acres in the geologic hazards study corridor.

Soils

The Mill Creek Alternative crosses 3.0 miles of soils with moderate susceptibility to water erosion and no miles of moderate or high susceptibility to wind erosion. This alternative crosses 3.5 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this alternative.

Minerals

The Mill Creek Alternative does not cross any mineral resources.

Paleontological Resources

The Mill Creek Alternative does not cross any geologic units with moderate, high, or very high sensitivity for paleontological resources.

SEGMENT 3—BAKER VALLEY

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-17 presents the miles crossed by geologic hazards for all alternative routes and route variations in Segment 3.

Table 3-17. Geologic Hazards Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)	
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84
Applicant's Proposed Action	55.2	0.6	0.0	0.0	55.2	0.0
Variation S3-A1	*12.4*	*0.1*	*0.0*	*0.0*	*12.4*	*0.0*
Variation S3-A2	*12.2*	*0.8*	*0.0*	*0.0*	*12.2*	*0.0*
Variation S3-B1	*13.9*	*0.5*	*0.0*	*0.0*	*13.9*	*0.0*
Variation S3-B2	*14.4*	*1.0*	*0.0*	*0.0*	*14.4*	*0.0*
Variation S3-B3	*14.7*	*0.9*	*0.0*	*0.0*	*14.7*	*0.0*
Variation S3-B4	*14.3*	*0.9*	*0.0*	*0.0*	*14.3*	*0.0*
Variation S3-B5	*14.0*	*1.1*	*0.0*	*0.0*	*14.0*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*21.1*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*21.7*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*21.1*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*21.4*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*21.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*
Flagstaff A	55.3	1.2	0.0	0.0	55.3	0.0
Timber Canyon	70.3	0.0	0.0	0.0	68.7	1.6
Flagstaff A – Burnt River Mountain	55.3	1.2	0.0	0.0	55.3	0.0
Flagstaff B	56.0	1.0	0.0	0.0	56.0	0.0
Flagstaff B – Burnt River West	55.7	1.7	0.0	0.0	55.7	0.0
Flagstaff B – Durkee	59.6	1.0	0.0	0.0	59.6	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 3.

The Applicant's Proposed Action Alternative for Segment 3 crosses 0.6 mile of older Quaternary faults, near Baker City. There are two previously reported earthquake epicenters for this alternative. Both of these occur in the Baker City area, and had magnitudes of less than 3. The Applicant's Proposed Action Alternative would not cross any areas with moderate or high landslide potential. This alternative crosses two areas with moderate liquefaction potential near Baker City and Durkee. This variation

crosses one area with a high percentile ranking for floodzones. This occurs along the Burnt River watershed and totals approximately 73 acres in the geologic hazards study corridor. The alternative also crosses two areas having a moderate percentile ranking for floodzones having 5,900 acres for the geologic hazards study corridor. These occur in the Burnt and Powder watersheds.

Variation S3-A1

This variation crosses 0.1 mile of older Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There is one area of moderate liquefaction potential occurring near the terminus of this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Powder watershed and totals approximately 189 acres in the geologic hazards study corridor.

Variation S3-A2

This variation crosses 0.8 mile of older Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Powder watershed and totals approximately 147 acres in the geologic hazards study corridor.

Variation S3-B1

This variation crosses 0.5 mile of older Quaternary faults. There is one previously recorded earthquake epicenters for this variation near Baker City. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There are no areas of moderate or high liquefaction potential for this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Powder watershed and totals approximately 899 acres in the geologic hazards study corridor.

Variation S3-B2

This variation crosses 1 mile of older Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There is one area of moderate liquefaction potential occurring near Baker City. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Powder watershed and totals approximately 1,045 acres in the geologic hazards study corridor.

Variation S3-B3

This variation crosses 0.9 mile of older Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There is one area of moderate liquefaction potential occurring near Baker City. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Powder watershed and totals approximately 1045 acres in the geologic hazards study corridor.

Variation S3-B4

This variation crosses 0.9 mile of older Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There is one area of moderate liquefaction potential occurring near Baker City. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Powder watershed and totals approximately 1,069 acres in the geologic hazards study corridor.

Variation S3-B5

This variation crosses 1.1 miles of older Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There is one area of moderate liquefaction potential occurring near Baker City This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Powder watershed and totals approximately 1,110 acres in the geologic hazards study corridor.

Variation S3-C1

This variation crosses no Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There are several small areas of moderate liquefaction potential occurring throughout this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Burnt watershed and totals approximately 4,820 acres in the geologic hazards study corridor.

Variation S3-C2

This variation crosses no Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There are several areas of moderate liquefaction potential scattered throughout this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Burnt watershed and totals approximately 4,410 acres in the geologic hazards study corridor.

Variation S3-C3

This variation crosses no Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There are several areas of moderate liquefaction potential scattered throughout this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Burnt watershed and totals approximately 3,945 acres in the geologic hazards study corridor.

Variation S3-C4

This variation crosses no Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation

within the geologic hazards study corridor. There are several areas of moderate liquefaction potential scattered throughout this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Burnt watershed and totals approximately 4,210 acres in the geologic hazards study corridor.

Variation S3-C5

This variation crosses no Quaternary faults. There is one previously recorded earthquake epicenters for this variation occurring near its terminus that had a magnitude of less than 6. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There are two areas of moderate liquefaction potential that occur in the first half of this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Burnt watershed and totals approximately 1,472 acres in the geologic hazards study corridor.

Variation S3-C6

This variation crosses no Quaternary faults. There are no previously recorded earthquake epicenters for this variation. There are no areas with moderate or high landslide susceptibility for this variation within the geologic hazards study corridor. There is one area of moderate liquefaction potential occurring near the terminus of this variation. This variation crosses one area with a moderate percentile ranking for floodzones. This occurs along the Burnt watershed and totals approximately 1,264 acres in the geologic hazards study corridor.

Soils

Table 3-18 presents the miles crossed by soil resources and their susceptibility to erosion and compaction for all alternative routes and route variations in Segment 3.

Table 3-18. Soils Inventory Data for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Applicant's Proposed Action	55.2	0.0	43.2	12.0	0.0	52.2	3.0	49.1	6.1
Variation S3-A1	*12.4*	*0.0*	*11.9*	*0.5*	*0.0*	*12.4*	*0.0*	*11.0*	*1.4*
Variation S3-A2	*12.2*	*0.0*	*12.2*	*0.0*	*0.0*	*12.2*	*0.0*	*9.3*	*2.9*
Variation S3-B1	*13.9*	*0.0*	*10.5*	*3.4*	*0.0*	*13.9*	*0.0*	*12.6*	*1.3*
Variation S3-B2	*14.4*	*0.0*	*13.1*	*1.3*	*0.0*	*14.4*	*0.0*	*12.5*	*1.9*
Variation S3-B3	*14.7*	*0.0*	*13.3*	*1.4*	*0.0*	*14.7*	*0.0*	*13.2*	*1.5*
Variation S3-B4	*14.3*	*0.0*	*12.4*	*1.9*	*0.0*	*14.3*	*0.0*	*13.4*	*0.9*
Variation S3-B5	*14.0*	*0.0*	*12.2*	*1.8*	*0.0*	*14.0*	*0.0*	*12.8*	*1.2*
Variation S3-C1	*21.1*	*0.0*	*14.1*	*7.0*	*0.0*	*18.1*	*3.0*	*19.3*	*1.8*
Variation S3-C2	*21.7*	*0.0*	*15.7*	*6.0*	*0.0*	*18.9*	*2.8*	*19.8*	*1.9*
Variation S3-C3	*21.1*	*0.1*	*16.5*	*4.5*	*0.0*	*21.0*	*0.1*	*15.5*	*5.6*

Table 3-18. Soils Inventory Data for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Variation S3-C4	*21.4*	*0.0*	*16.7*	*4.7*	*0.0*	*21.4*	*0.0*	*16.0*	*5.4*
Variation S3-C5	*21.0*	*0.8*	*17.0*	*3.2*	*0.0*	*21.0*	*0.0*	*16.8*	*4.2*
Variation S3-C6	*24.7*	*2.3*	*18.8*	*3.6*	*0.0*	*24.7*	*0.0*	*20.5*	*4.2*
Flagstaff A	55.3	0.0	44.9	10.4	0.0	52.3	3.0	49.3	6.0
Timber Canyon	70.3	2.8	55.7	11.8	0.0	69.4	0.9	63.2	7.1
Flagstaff A – Burnt River Mountain	55.3	0.1	47.3	7.9	0.0	55.2	0.1	45.5	9.8
Flagstaff B	56.0	0.0	46.0	10.0	0.0	53.0	3.0	49.7	6.3
Flagstaff B – Burnt River West	55.7	0.8	49.2	5.7	0.0	55.7	0.0	45.5	10.2
Flagstaff B – Durkee	59.6	2.3	50.7	6.6	0.0	59.6	0.0	50.9	8.7

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

The Applicant's Proposed Action Alternative for Segment 3 crosses 12 miles of soils with moderate susceptibility to water erosion and 3 miles of moderate susceptibility to wind erosion. This alternative crosses 6.1 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of the Applicant's Proposed Action Alternative.

Variation S3-A1

This variation crosses 0.5 mile of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 1.4 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-A2

This variation crosses no miles of soils with moderate or high susceptibility to water or wind erosion. This variation crosses 2.9 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-B1

This variation crosses 3.4 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 1.3 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-B2

This variation crosses 1.3 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 1.9 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-B3

This variation crosses 1.4 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 1.5 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-B4

This variation crosses 1.9 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 0.9 mile of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-B5

This variation crosses 1.8 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 1.2 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-C1

This variation crosses 7.0 miles of soils with moderate susceptibility to water erosion and 3.0 miles of soils with moderate susceptibility to wind erosion. This variation crosses 1.8 miles of soils with high compaction potential. Droughty and stony/rocky soils occur at the beginning and end of this variation.

Variation S3-C2

This variation crosses 6.0 miles of soils with moderate susceptibility to water erosion and 2.8 miles of soils with moderate susceptibility to wind erosion. This variation crosses 1.9 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-C3

This variation crosses 4.5 miles of soils with moderate susceptibility to water erosion and 0.1 mile of soils with moderate susceptibility to wind erosion. This variation crosses 5.6 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-C4

This variation crosses 4.7 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 5.4 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-C5

This variation crosses 3.2 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 4.2 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Variation S3-C6

This variation crosses 3.6 miles of soils with moderate susceptibility to water erosion and no miles of soils with moderate or high susceptibility to wind erosion. This variation crosses 4.2 miles of soils with high compaction potential. Droughty and stony/rocky soils occur throughout the length of this variation.

Minerals

Table 3-19 presents the miles crossed by mineral resources for all alternative routes and route variations in Segment 3.

Table 3-19. Minerals Inventory Data for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Active Mine or Active Mining Claims	All Leases	Producing Oil and Gas or Geothermal Wells
Applicant's Proposed Action	55.2	1.9	0.0	0.0
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*1.1*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*0.3*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*0.3*	*0.0*	*0.0*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*0.8*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*1.8*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*3.3*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*3.3*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*1.6*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*4.2*	*0.0*	*0.0*
Flagstaff A	55.3	0.8	0.0	0.0
Timber Canyon	70.3	2.5	0.0	0.0
Flagstaff A – Burnt River Mountain	55.3	3.3	0.0	0.0
Flagstaff B	56.0	1.1	0.0	0.0
Flagstaff B – Burnt River West	55.7	1.9	0.0	0.0
Flagstaff B – Durkee	59.6	4.5	0.0	0.0

Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

The Applicant's Proposed Action Alternative for Segment 3 crosses 1.9 miles of active mines or mining claims. Most of these occur in the Baker City-Durkee area. There are no leases or producing wells crossed by the Applicant's Proposed Action Alternative.

Variations S3-A1 and S3-A2

These variations do not cross mineral resources.

Variation S3-B1

This variation crosses 1.1 miles of active mines or mining claims that occur in the Baker City area.

Variations S3-B2 and S3-B3

These variations crosses 0.3 mile of active mines or mining claims that occur in the Baker City area.

Variations S3-B4 and S3-B5

These variations do not cross mineral resources.

Variation S3-C1

This variation crosses 0.8 mile of active mines or mining claims that occur near Durkee.

Variation S3-C2

This variation crosses 1.8 miles of active mines or mining claims that occur near Durkee.

Variations S3-C3 and S3-C4

These variations cross 3.3 miles of active mines or mining claims that occur near Durkee.

Variation S3-C5

This variation crosses 1.6 miles of active mines or mining claims that occur near Durkee.

Variation S3-C6

This variation crosses 4.2 miles of active mines or mining claims that occur near Durkee.

Paleontological Resources

Table 3-20 presents the miles crossed by paleontological resources for all alternative routes and route variations in Segment 3.

Table 3-20. Paleontological Resources Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)				
		1	2	3	4	5
Applicant's Proposed Action	55.2	13.4	21.9	4.8	15.1	0.0
Variation S3-A1	*12.4*	*9.9*	*2.5*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*8.6*	*3.6*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*2.8*	*9.3*	*0.0*	*1.8*	*0.0*
Variation S3-B2	*14.4*	*0.8*	*9.7*	*0.0*	*3.9*	*0.0*
Variation S3-B3	*14.7*	*0.8*	*9.5*	*0.0*	*4.4*	*0.0*
Variation S3-B4	*14.3*	*0.7*	*8.0*	*0.0*	*5.6*	*0.0*
Variation S3-B5	*14.0*	*0.7*	*9.3*	*0.0*	*4.0*	*0.0*
Variation S3-C1	*21.1*	*0.7*	*5.9*	*4.8*	*9.7*	*0.0*
Variation S3-C2	*21.7*	*0.8*	*6.6*	*4.8*	*9.5*	*0.0*
Variation S3-C3	*21.1*	*6.8*	*4.3*	*5.8*	*4.2*	*0.0*
Variation S3-C4	*21.4*	*7.1*	*5.4*	*5.8*	*3.1*	*0.0*
Variation S3-C5	*21.0*	*8.6*	*4.0*	*5.9*	*2.5*	*0.0*
Variation S3-C6	*24.7*	*10.6*	*4.7*	*5.8*	*3.6*	*0.0*
Flagstaff A	55.3	11.3	21.9	4.8	17.3	0.0
Timber Canyon	70.3	30.6	26.1	4.8	8.8	0.0
Flagstaff A – Burnt River Mountain	55.3	17.4	20.3	5.8	11.8	0.0

Table 3-20. Paleontological Resources Inventory Data for Segment 3—Baker Valley						
Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)				
		1	2	3	4	5
Flagstaff B	56.0	11.4	22.1	4.8	17.7	0.0
Flagstaff B – Burnt River West	55.7	18.0	21.3	5.9	10.5	0.0
Flagstaff B – Durkee	59.6	21.3	20.9	5.8	11.6	0.0

The Applicant's Proposed Action Alternative for Segment 3 crosses 15.1 miles of geologic units with a high sensitivity for paleontological resources (PFYC 4), and 4.8 miles of geologic units with a moderate sensitivity (PFYC 3) for paleontological resources.

Variations S3-A1 and S3-A2

These variations do not cross geologic units with a moderate or high sensitivity for paleontological resources.

Variation S3-B1

This variation crosses 1.8 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and no geologic units with a moderate sensitivity (PFYC 3).

Variation S3-B2

This variation crosses 3.9 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and no geologic units with a moderate sensitivity (PFYC 3).

Variation S3-B3

This variation crosses 4.4 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and no geologic units with a moderate sensitivity (PFYC 3).

Variation S3-B4

This variation crosses 5.6 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and no geologic units with a moderate sensitivity (PFYC 3).

Variation S3-B5

This variation crosses 4.0 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and no geologic units with a moderate sensitivity (PFYC 3).

Variation S3-C1

This variation crosses 9.7 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 4.8 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S3-C2

This variation crosses 9.5 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 4.8 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S3-C3

This variation crosses 4.2 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 5.8 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S3-C4

This variation crosses 3.1 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 5.8 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S3-C5

This variation crosses 2.5 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 5.9 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S3-C6

This variation crosses 3.6 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 5.8 miles of geologic units with a moderate sensitivity (PFYC 3).

Flagstaff A Alternative

Geologic Hazards

The Flagstaff A Alternative crosses 1.2 miles of older Quaternary faults near Baker City. There are two previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. These occur near Baker City and both had a magnitude of less than 3. There are no areas with moderate or high landslide potential for this alternative. This alternative crosses two areas with moderate liquefaction potential near Baker City and Durkee. This variation crosses two areas with a moderate percentile ranking for floodzones. These occur along the Burnt and Powder watersheds and total approximately 6,109 acres in the geologic hazards study corridor.

Soils

The Flagstaff A Alternative crosses 10.4 miles of soils with moderate susceptibility to water erosion and 3 miles of moderate susceptibility to wind erosion. This alternative crosses 6 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this alternative.

Minerals

The Flagstaff A Alternative crosses 0.8 mile of active mines or mining claims. These occur in the Baker City and Durkee areas.

Paleontological Resources

The Flagstaff A Alternative crosses 17.3 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 4.8 miles of geologic units with a moderate sensitivity (PFYC 3) for paleontological resources.

Timber Canyon Alternative

Geologic Hazards

The Timber Canyon Alternative does not cross any older Quaternary faults. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. This alternative crosses 1.6 miles of areas with moderate landslide potential on Link 3-8. This alternative has two areas with moderate liquefaction potential also on Link 3-8. This variation crosses two areas with a moderate percentile ranking for floodzones. These occur along the Burnt and Powder watersheds and total approximately 4,862 acres in the geologic hazards study corridor.

Soils

The Timber Canyon Alternative crosses 11.8 miles of soils with moderate susceptibility to water erosion and 0.9 mile of moderate susceptibility to wind erosion. This alternative crosses 7.1 miles of soils with high compaction potential. Droughty and stony/rocky soils are found within the last half of this alternative.

Minerals

The Timber Canyon Alternative crosses 2.5 miles of active mines or mining claims. These occur northeast and east of Baker City.

Paleontological Resources

The Timber Canyon Alternative crosses 8.8 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 4.8 miles with a moderate sensitivity (PFYC 3).

Flagstaff A – Burnt River Mountain Alternative

Geologic Hazards

The Burnt River Mountain Alternative crosses 1.2 miles of older Quaternary faults near Baker City. There is one previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative near Baker City. This earthquake had a magnitude of less than 2. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative has one area with moderate liquefaction potential near Baker City. This variation crosses two areas with a moderate percentile ranking for floodzones. These occur along the Burnt and Powder watersheds and total approximately 5,233 acres in the geologic hazards study corridor.

Soils

The Burnt River Mountain Alternative crosses 7.9 miles of soils with moderate susceptibility to water erosion and 0.1 mile of moderate susceptibility to wind erosion. This alternative crosses 9.8 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this alternative.

Minerals

The Burnt River Mountain Alternative crosses 3.3 miles of active mines or mining claims, including the Ash Grove Limestone Mine. These occur near Baker City.

Paleontological Resources

The Burnt River Mountain Alternative crosses 11.8 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 5.8 miles of geologic units with a moderate sensitivity (PFYC 3).

Flagstaff B Alternative

Geologic Hazards

The Flagstaff B Alternative crosses 1.0 mile of older Quaternary faults near Baker City. There is one previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative southeast of Baker City. This earthquake had a magnitude of less than 3. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses two areas with moderate liquefaction potential near Baker City and Durkee. This variation crosses two areas with a moderate percentile ranking for floodzones. These occur along the Burnt and Powder watersheds and total approximately 6,044 acres in the geologic hazards study corridor.

Soils

The Flagstaff B Alternative crosses 10 miles of soils with moderate susceptibility to water erosion and 3.0 miles of moderate susceptibility to wind erosion. This alternative crosses 6.3 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this alternative.

Minerals

The Flagstaff B Alternative crosses 1.1 miles of active mines or mining claims. These occur near Baker City.

Paleontological Resources

The Flagstaff B Alternative crosses 17.7 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 4.8 miles of geologic units with a moderate sensitivity (PFYC 3).

Flagstaff B – Burnt River West Alternative

Geologic Hazards

The Burnt River West Alternative crosses 1.7 miles of older Quaternary faults near Baker City. There are two previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. One is near Baker City and the other is close to the terminus of the alternative. Both of these earthquakes had a magnitude of less than 6. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses one area with moderate liquefaction potential near Baker City. This variation crosses two areas with a moderate percentile ranking for floodzones. These occur along the Burnt and Powder watersheds and total approximately 2,458 acres in the geologic hazards study corridor.

Soils

The Burnt River West Alternative crosses 5.7 miles of soils with moderate susceptibility to water erosion and 0.0 mile of moderate susceptibility to wind erosion. This alternative crosses 10.3 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this alternative.

Minerals

The Burnt River West Alternative crosses 1.9 miles of active mines or mining claims. These occur near Baker City.

Paleontological Resources

The Burnt River West Alternative crosses 10.5 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 5.9 miles of geologic units with a moderate sensitivity (PFYC 3).

Flagstaff B – Durkee

Geologic Hazards

The Flagstaff B – Durkee Alternative crosses 1.0 mile of older Quaternary faults near Baker City. There are two previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. One is near Baker City and the other is southeast of Baker City along Link 3-55. Both of these earthquakes had a magnitude of less than 6. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses three areas with moderate liquefaction potential; one near Baker City, and two more south of Baker City along Link 3-74. This variation crosses two areas with a moderate percentile ranking for floodzones. These occur along the Burnt and Powder watersheds and total approximately 2,488 acres in the geologic hazards study corridor.

Soils

The Flagstaff B – Durkee Alternative crosses 6.6 miles of soils with moderate susceptibility to water erosion and 0.0 mile of moderate susceptibility to wind erosion. This alternative crosses 8.7 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this alternative.

Minerals

The Flagstaff B – Durkee Alternative crosses 4.5 miles of active mines or mining claims. These occur in the Baker City and Durkee areas.

Paleontological Resources

The Flagstaff B – Durkee Alternative crosses 11.6 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 5.8 miles of geologic units with a moderate sensitivity (PFYC 3).

SEGMENT 4—BROGAN

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-21 presents the miles crossed by geologic hazards for all alternative routes and route variations in Segment 4.

Table 3-21. Geologic Hazards Inventory Data for Segment 4—Brogan

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)	
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84
Applicant's Proposed Action	40.1	0.4	0.0	0.8	40.1	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*5.9*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*6.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*6.1*	*0.0*
Tub Mountain South	40.5	0.0	0.0	0.1	40.5	0.0
Willow Creek	34.6	0.0	0.0	0.1	34.6	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 4.

The Applicant's Proposed Action Alternative for Segment 4 would cross 0.8 mile of recent Quaternary faults and 0.4 mile of older Quaternary faults. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses one area with moderate liquefaction potential. This occurs at the beginning of the alternative. This variation crosses two areas with a moderate percentile ranking for floodzones. These occur along the Burnt and Willow watersheds and total approximately 2,359 acres in the geologic hazards study corridor.

Variation S4-A1

This variation does not cross any Quaternary faults or areas with moderate or high landslide potential. There are no previously reported earthquake epicenters within the geologic hazards study corridor for this variation. There are three small areas of moderate liquefaction potential scattered throughout the length of the variation. This variation crosses one area with a moderate percentile ranking for floodzone. This floodzone occurs along the Burnt watershed and totals approximately 1,891 acres in the geologic hazards study corridor.

Variation S4-A2

This variation does not cross any Quaternary faults or areas with moderate or high landslide potential. There are no previously reported earthquake epicenters within the geologic hazards study corridor for this variation. There are three small areas of moderate liquefaction potential scattered throughout the

length of the variation. This variation crosses one area with a moderate percentile ranking for floodzone. This floodzone occurs along the Burnt watershed and totals approximately 2,392 acres in the geologic hazards study corridor.

Variation S4-A3

This variation does not cross any Quaternary faults or areas with moderate or high landslide potential. There are no previously reported earthquake epicenters within the geologic hazards study corridor for this variation. There are no areas with moderate or high liquefaction potential for this variation. This variation crosses one area with a moderate percentile ranking for floodzone. This floodzone occurs along the Burnt River watershed and totals approximately 2,346 acres in the geologic hazards study corridor.

Soils

Table 3-22 presents the miles crossed by soil resources for all alternative routes and route variations in Segment 4.

Table 3-22. Soils Inventory Data for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Applicant's Proposed Action	40.1	0.0	26.9	13.2	0.0	38.6	1.5	13.6	26.5
Variation S4-A1	*5.9*	*0.0*	*4.7*	*1.2*	*0.0*	*5.4*	*0.5*	*5.0*	*0.9*
Variation S4-A2	*6.0*	*0.0*	*3.6*	*2.4*	*0.0*	*5.3*	*0.7*	*5.3*	*0.7*
Variation S4-A3	*6.1*	*0.0*	*3.7*	*2.4*	*0.0*	*5.4*	*0.7*	*5.3*	*0.8*
Tub Mountain South	40.5	0.3	15.4	24.8	0.3	33.3	6.9	16.7	23.8
Willow Creek	34.6	0.0	19.1	15.5	0.0	29.1	5.5	14.1	20.5

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

The Applicant's Proposed Action Alternative for Segment 4 crosses 13.2 miles of soils with moderate susceptibility to water erosion and 1.5 miles of moderate susceptibility to wind erosion. This alternative crosses 26.5 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this alternative.

Variation S4-A1

This variation crosses 1.2 miles of soils with moderate susceptibility to water erosion and 0.5 mile of moderate susceptibility to wind erosion. This alternative crosses 0.9 mile of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this variation.

Variation S4-A2

This variation crosses 2.4 miles of soils with moderate susceptibility to water erosion and 0.7 mile of moderate susceptibility to wind erosion. This alternative variation crosses 0.7 mile of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this variation.

Variation S4-A3

This variation crosses 2.4 miles of soils with moderate susceptibility to water erosion and 0.7 mile of moderate susceptibility to wind erosion. This alternative crosses 0.8 mile of soil with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this variation.

Minerals

Table 3-23 presents the miles crossed by mineral resources for all alternative routes and route variations in Segment 4.

Table 3-23. Minerals Inventory Data for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Active Mine or Active Mining Claims	All Leases	Producing Oil and Gas or Geothermal Wells
Applicant's Proposed Action	40.1	3.8	6.0	1.1
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*
Tub Mountain South	40.5	3.7	22.7	3.7
Willow Creek	34.6	2.7	4.6	1.1

Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

The Applicant's Proposed Action Alternative for Segment 4 crosses 3.8 miles of active mines or mining claims, 6.0 miles of leases, and 1.1 miles of producing wells. These occur near the west end of Segment 4 between Links 4-10 and 4-15, and south of Jamieson near Link 4-70. Variations S4-A1, S4-A2, and S4-A3 cross no mineral resources.

Paleontological Resources

Table 3-24 presents the miles crossed by paleontological resources for all alternative routes and route variations in Segment 4.

Table 3-24. Paleontological Resources Inventory Data for Segment 4—Brogan

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)				
		1	2	3	4	5
Applicant's Proposed Action	40.1	8.6	14.7	5.8	11.0	0.0
Variation S4-A1	*5.9*	*0.0*	*2.7*	*2.7*	*0.5*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*2.3*	*3.1*	*0.6*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*2.2*	*3.3*	*0.6*	*0.0*

Table 3-24. Paleontological Resources Inventory Data for Segment 4—Brogan						
Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)				
		1	2	3	4	5
Tub Mountain South	40.5	0.0	10.0	3.1	27.4	0.0
Willow Creek	34.6	0.0	10.2	2.7	21.7	0.0

The Applicant's Proposed Action Alternative for Segment 4 crosses 11.0 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 5.8 miles with moderate sensitivity (PFYC 3).

Variation S4-A1

This variation crosses 0.5 mile of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 2.7 miles with moderate sensitivity (PFYC 3).

Variation S4-A2

This variation crosses 0.6 mile of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 3.1 miles with moderate sensitivity (PFYC 3).

Variation S4-A3

This variation crosses 0.6 mile of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 3.3 miles with moderate sensitivity (PFYC 3).

Tub Mountain South Alternative

Geologic Hazards

The Tub Mountain South Alternative crosses 0.1 mile of recent Quaternary faults along Link 4-75. There are two previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. These occur west of Weiser along Link 4-75 and had magnitudes of less than 4. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses three areas with moderate liquefaction potential. These occur at mileposts 7, 13, and 20 along Link 4-75. This variation crosses three areas with a high percentile ranking for floodzones. These occur along the Burnt, Willow, and Brownlee Reservoir watersheds totaling approximately 3,355 acres in the geologic hazards study corridor. These same watersheds have areas with moderate percentile ranking for floodzones totaling approximately 7,101 acres.

Soils

The Tub Mountain Alternative crosses 24.8 miles of soils with moderate susceptibility to water erosion and 6.9 miles of moderate susceptibility to wind erosion. This alternative crosses 23.8 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this variation.

Minerals

The Tub Mountain Alternative crosses 3.7 miles of active mines and mining claims, 22.7 miles of leases, and 3.7 miles of producing wells. These occur at the beginning of the Segment between Links 4-10 and 4-30, and east of Jamieson between Links 4-30 and 4-75.

Paleontological Resources

The Tub Mountain Alternative crosses 27.4 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 3.1 miles with moderate sensitivity (PFYC 3).

Willow Creek Alternative

Geologic Hazards

The Willow Creek Alternative crosses 0.1 mile of recent Quaternary faults at milepost 12, along Link 4-70. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses two areas with moderate liquefaction potential. These occur at milepost 3 on Link 4-40, and milepost 5 on Link 4-60. This alternative crosses one with a high percentile ranking for floodzones. This occurs along the Brownlee Reservoir watershed totaling approximately 452 acres in the geologic hazards study corridor. The alternative also crosses three areas with moderate percentile ranking for floodzones. These occur along the Willow, Burnt, and Brownlee Reservoirs totaling approximately 4,193 acres.

Soils

This Willow Creek Alternative crosses 15.5 miles of soils with moderate susceptibility to water erosion and 5.5 miles of moderate susceptibility to wind erosion. This alternative crosses 20.5 miles of soils with high compaction potential. Droughty and stony/rocky soils are found scattered throughout the length of this variation.

Minerals

The Willow Creek Alternative crosses 2.7 miles of active mines and mining claims, 4.6 miles of leases, and 1.1 miles of producing oil and gas or geothermal wells. These at the beginning of the Segment between Links 4-10 and 4-20, and south of Jamieson near Link 4-70.

Paleontological Resources

The Willow Creek Alternative crosses 21.7 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 2.7 miles with moderate sensitivity (PFYC 3).

SEGMENT 5—MALHEUR

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-25 presents the miles crossed by geologic hazards for all alternative routes and route variations in Segment 5.

Table 3-25. Geologic Hazards Inventory Data for Segment 5—Malheur

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)	
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84
Applicant's Proposed Action	40.4	0.0	0.0	0.0	40.4	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*2.5*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*
Malheur S	43.5	0.1	0.0	0.0	43.5	0.0
Malheur A	43.1	0.1	0.0	0.0	43.1	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 5.

The Applicant's Proposed Action Alternative for Segment 5 crosses no Quaternary fault. There is one previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. This epicenter occurs near Link 5-15 and had a magnitude of less than 6. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses two areas with moderate liquefaction potential. These occur along Link 5-5 and 5-40. The Applicant's Proposed Action Alternative crosses one are with a high percentile ranking for floodzones. This occurs along the Middle Snake-Succor watershed and totals approximately 497 acres within the geologic hazards study corridor. This alternative crosses two areas with a moderate percentile ranking for floodzones. These occur along the Lower Owyhee and Lower Malheur watersheds approximately 706 acres in the geologic hazards study corridor.

Variations S5-A1 and S5-A2

These variations cross no Quaternary fault. There is one previously recorded earthquake epicenters within the geologic hazard study corridor for these variations. This epicenter occurs south of Highway 20 and had a magnitude of less than 6. These variations cross 0.0 mile of areas with moderate or high landslide potential. These variations cross three areas with moderate liquefaction potential. These are scattered throughout the length of the variations. The variations cross no areas with moderate or high percentile for floodzones.

Variation S5-B1

This variation crosses no Quaternary fault. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this variation. This variation crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses one area with moderate liquefaction potential. The variation crosses one area with high percentile for floodzones. This occurs along the

Lower Owyhee watershed and has approximately 497 acres within the geologic hazards study corridor. An area of moderate percentile for floodzones also occurs along the same watershed with 112 acres.

Variation S5-B2

This variation crosses no Quaternary fault. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this variation. This variation crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses one area with high liquefaction potential near the center of the variation. The variation crosses one area with high percentile for floodzones. This occurs along the Lower Owyhee watershed and has approximately 749 acres within the geologic hazards study corridor. An area of moderate percentile for floodzones also occurs along the same watershed with 109 acres.

Soils

Table 3-26 presents the miles crossed by soil resources for all alternative routes and route variations in Segment 5.

Table 3-26. Soils Inventory Data Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Applicant's Proposed Action	40.4	0.0	27.1	13.3	0.0	39.6	0.8	15.2	25.2
Variation S5-A1	*7.4*	*0.0*	*6.4*	*1.0*	*0.0*	*7.4*	*0.0*	*2.4*	*5.0*
Variation S5-A2	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*	*7.4*	*0.0*	*2.6*	*4.8*
Variation S5-B1	*2.5*	*0.0*	*1.0*	*1.5*	*0.0*	*2.5*	*0.0*	*1.0*	*1.5*
Variation S5-B2	*2.8*	*0.0*	*1.5*	*1.3*	*0.0*	*2.8*	*0.0*	*2.2*	*0.6*
Malheur S	43.5	0.0	32.0	11.5	0.0	43.3	0.2	14.8	28.7
Malheur A	43.1	0.0	32.5	10.6	0.0	42.6	0.5	14.0	29.1

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

The Applicant's Proposed Action Alternative for Segment 5 crosses 13.3 miles of soils with moderate susceptibility to water erosion and 0.8 mile of moderate susceptibility to wind erosion. This alternative crosses 25.2 miles of soils with high compaction potential. No data was available for droughty or stony/rocky soils for this Segment.

Variation S5-A1

This variation crosses 1.0 mile of soils with moderate susceptibility to water erosion and 0.0 mile of moderate susceptibility to wind erosion. This alternative crosses 5.0 miles of soils with high compaction potential. No data was available for droughty or stony/rocky soils for this Segment.

Variation S5-A2

This variation crosses 0.0 mile of soils with moderate susceptibility to water erosion and 0.0 mile of moderate susceptibility to wind erosion. This alternative crosses 4.8 miles of soils with high compaction potential. No data was available for droughty or stony/rocky soils for this Segment.

Variation S5-B1

This variation crosses 1.5 miles of soils with moderate susceptibility to water erosion and 0.0 mile of moderate susceptibility to wind erosion. This alternative crosses 1.5 miles of soils with high compaction potential. No data was available for droughty or stony/rocky soils for this Segment.

Variation S5-B2

This variation crosses 1.3 miles of soils with moderate susceptibility to water erosion and 0.0 mile of moderate susceptibility to wind erosion. This alternative crosses 0.6 mile of soils with high compaction potential. No data was available for droughty or stony/rocky soils for this Segment.

Minerals

Table 3-27 presents the miles crossed by mineral resources for all alternative routes and route variations in Segment 5.

Table 3-27. Minerals Inventory Data for Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Active Mine or Active Mining Claims	All Leases	Producing Oil and Gas or Geothermal Wells
Applicant's Proposed Action	40.4	0.3	16.5	0.0
Variation S5-A1	*7.4*	*0.0*	*4.3*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*6.7*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*
Malheur S	43.5	3.9	12.1	0.0
Malheur A	43.1	6.0	12.1	0.0

Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

The Applicant's Proposed Action Alternative for Segment 5 crosses 0.3 mile of active mines and mining claims, and 16.5 miles of leases. The leases occur between Harper and Vale, and several active mines or mining claims or within the study corridor towards the end of the Applicant's Proposed Action Alternative.

Variation S5-A1

This variation crosses 4.3 miles of leases between Vale and Harper.

Variation S5-A2

This variation crosses 6.7 miles of leases between Vale and Harper.

Variation S5-B1 and S5-B2

These variations cross no mineral resources.

Paleontological Resources

Table 3-28 presents the miles crossed by paleontological resources for all alternative routes and route variations in Segment 5.

Table 3-28. Paleontological Resources Inventory Data for Segment 5—Malheur

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)				
		1	2	3	4	5
Applicant's Proposed Action	40.4	1.0	13.5	0.0	25.9	0.0
Variation S5-A1	*7.4*	*0.0*	*1.3*	*0.0*	*6.1*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*1.4*	*0.0*	*1.1*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*1.4*	*0.0*	*1.4*	*0.0*
Malheur S	43.5	1.5	19.1	0.0	22.9	0.0
Malheur A	43.1	1.2	18.6	0.0	23.3	0.0

The Applicant's Proposed Action Alternative for Segment 5 crosses 25.9 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 0.0 mile of geologic units with a moderate sensitivity (PFYC 3).

Variation S5-A1

This variation crosses 6.1 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 0.0 mile of geologic units with a moderate sensitivity (PFYC 3).

Variation S5-A2

This variation crosses 7.4 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 0.0 mile of geologic units with a moderate sensitivity (PFYC 3).

Variation S5-B1

This variation crosses 1.1 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 0.0 mile of geologic units with a moderate sensitivity (PFYC 3).

Variation S5-B2

This variation crosses 1.4 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources, and 0.0 mile of geologic units with a moderate sensitivity (PFYC 3).

Malheur S Alternative

Geologic Hazards

The Malheur S Alternative crosses 0.1 mile of Class B faults along Link 5-25. There is one previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. This epicenter occurs near Link 5-25 and had a magnitude of less than 6. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses five areas with moderate liquefaction potential. These occur along Link 5-5, mileposts 5-6 and 12-15 of Link 5-25, and milepost 5 of Link 5-30. The Applicant's Proposed Action Alternative crosses no areas with a high percentile

ranking for floodzones. This alternative crosses two areas with a moderate percentile ranking for floodzones. These occur along the Lower Malheur and Lower Owyhee watersheds and total approximately 2,026 acres in the geologic hazards study corridor.

Soils

The Malheur S Alternative crosses 11.5 miles of soils with moderate susceptibility to water erosion and 0.2 mile of moderate susceptibility to wind erosion. This alternative crosses 28.7 miles of soils with high compaction potential. No data was available for droughty or stony/rocky soils for this Segment.

Minerals

The Malheur S Alternative crosses 3.9 miles of active mines and mining claims, 12.1 miles of leases, and 2.0 miles of oil and gas, or geothermal producing wells that occur in the Harper area.

Paleontological Resources

The Malheur S Alternative crosses 22.9 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 0.0 mile of geologic units with a moderate sensitivity (PFYC 3).

Malheur A Alternative

Geologic Hazards

The Malheur A Alternative crosses 0.1 mile of Class B faults along Link 5-25. There is one previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. This epicenter occurs near milepost 3 of Link 5-25 and had a magnitude of less than 6. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. This alternative crosses five areas with moderate liquefaction potential. These occur at Link 5-5, mileposts 5-6 and 12-15 of Link 5-25, and mileposts 3-5 of Link 5-35. The Applicant's Proposed Action Alternative crosses no areas with a high percentile ranking for floodzones. This alternative crosses two areas with a moderate percentile ranking for floodzones. These occur along the Lower Malheur and Lower Owyhee watersheds and total approximately 2,117 acres in the geologic hazards study corridor.

Soils

The Malheur A Alternative crosses 10.6 miles of soils with moderate susceptibility to water erosion and 0.5 mile of moderate susceptibility to wind erosion. This alternative crosses 29.1 miles of soils with high compaction potential. No data was available for droughty or stony/rocky soils for Segment 5.

Minerals

The Malheur A Alternative crosses 6.0 miles of active mines and mining claims, 12.1 miles of leases, and 2.0 miles of producing wells that occur in the Harper area.

Paleontological Resources

The Malheur Alternative crosses 23.3 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 0.0 mile of geologic units with a moderate sensitivity (PFYC 3).

SEGMENT 6—TREASURE VALLEY

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-29 presents the miles crossed by geologic hazards for all alternative routes and route variations in Segment 6.

Table 3-29. Geologic Hazards Inventory Data for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)	
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84
Applicant's Proposed Action	28.0	1.4	0.0	0.0	28.0	0.0
Variation S6-A1	*9.3*	*0.8*	*0.0*	*0.0*	*9.3*	*0.0*
Variation S6-A2	*8.9*	*0.2*	*0.0*	*0.0*	*8.9*	*0.0*
Variation S6-B1	*14.4*	*0.6*	*0.0*	*0.0*	*14.4*	*0.0*
Variation S6-B2	*14.1*	*1.2*	*0.0*	*0.0*	*14.1*	*0.0*

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 6.

The Applicant's Proposed Action Alternative for Segment 6 crosses 1.4 miles of older Quaternary faults along Link 6-20. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this alternative. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. There was no liquefaction data available for the Idaho portion of Segment 6. The Applicant's Proposed Action Alternative crosses one area with a high percentile ranking for floodzones. This occurs along the Middle Snake-Succor watershed and totals approximately 1,541 acres within the geologic hazards study corridor. The Middle Snake-Succor watershed also has an approximate area of 564 acres within the geologic hazards study corridor for the Applicant's Proposed Action Alternative having a moderate ranking for floodzones.

Variation S6-A1

This variation crosses 0.8 mile of older Quaternary faults. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this variation. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. There was no liquefaction data available for the Idaho portion of Segment 6. The Applicant's Proposed Action Alternative crosses no areas with moderate or high percentile ranking for floodzones.

Variation S6-A2

This variation crosses 0.2 mile of older Quaternary faults. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this variation. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. There was no liquefaction data available for the

Idaho portion of Segment 6. The Applicant's Proposed Action Alternative crosses no areas with moderate or high percentile ranking for floodzones.

Variation S6-B1

This variation crosses 0.6 mile of older Quaternary faults. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this variation. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. There was no liquefaction data available for the Idaho portion of Segment 6. This variation crosses one are with a high percentile ranking for floodzones. This occurs along the Middle Snake-Succor watershed and totals approximately 785 acres within the geologic hazards study corridor. The Middle Snake-Succor watershed also has an approximate area of 294 acres within the geologic hazards study corridor for the Applicant's Proposed Action Alternative having a moderate ranking for floodzones.

Variation S6-B2

This variation crosses 1.2 miles of older Quaternary faults. There are no previously recorded earthquake epicenters within the geologic hazard study corridor for this variation. This alternative crosses 0.0 mile of areas with moderate or high landslide potential. There was no liquefaction data available for the Idaho portion of Segment 6. This variation crosses one area with a high percentile ranking for floodzones. This occurs along the Middle Snake-Succor watershed and totals approximately 768 acres within the geologic hazards study corridor. The Middle Snake-Succor watershed also has an approximate area of 185 acres within the geologic hazards study corridor for the Applicant's Proposed Action Alternative having a moderate ranking for floodzones.

Soils

Table 3-30 presents the miles crossed by soil resources for all alternative routes and route variations in Segment 6.

Table 3-30. Soils Inventory Data Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]	
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate
Applicant's Proposed Action	28.0	0.4	25.5	2.1	0.4	27.0	0.6	25.9	2.1
Variation S6-A1	*9.3*	*0.3*	*8.2*	*0.8*	*0.3*	*8.9*	*0.1*	*7.9*	*1.4*
Variation S6-A2	*8.9*	*0.3*	*8.0*	*0.6*	*0.3*	*8.5*	*0.1*	*7.4*	*1.5*
Variation S6-B1	*14.4*	*0.1*	*13.3*	*1.0*	*0.1*	*14.0*	*0.3*	*14.4*	*0.0*
Variation S6-B2	*14.1*	*0.0*	*13.7*	*0.4*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*

Table Notes:

[1]Soil compaction potential is based on clay content.

No high impacts are anticipated for soil resoures.

The Applicant's Proposed Action Alternative for Segment 6 crosses 2.1 miles of soils with moderate susceptibility to water erosion and 0.6 mile of moderate susceptibility to wind erosion. This alternative crosses 2.1 miles of soils with high compaction potential. Droughty soils are found throughout the Applicant's Proposed Action Alternative for Segment 6, but stony/soils are only found in two areas near the terminus of the Applicant's Proposed Action Alternative.

Variation S6-A1

This variation crosses 0.8 mile of soils with moderate susceptibility to water erosion and 0.1 mile of moderate susceptibility to wind erosion. This alternative crosses 1.4 miles of soils with high compaction potential. Droughty soils are found throughout this variation, but stony/soils are crossed only once near the middle of this variation.

Variation S6-A2

This variation crosses 0.6 mile of soils with moderate susceptibility to water erosion and 0.1 mile of moderate susceptibility to wind erosion. This alternative crosses 1.5 miles of soils with high compaction potential. Droughty soils are found throughout this variation, but stony/soils are crossed only once near the middle of this variation.

Variation S6-B1

This variation crosses 1.0 mile of soils with moderate susceptibility to water erosion and 0.3 mile of moderate susceptibility to wind erosion. This alternative crosses 0.0 mile of soils with high compaction potential. Droughty soils are found throughout this variation but stony/soils are crossed only once near the terminus of the variation.

Variation S6-B2

This variation crosses 0.4 mile of soils with moderate susceptibility to water erosion and 0.0 mile of moderate susceptibility to wind erosion. This alternative crosses 0.0 mile of soils with high compaction potential. Droughty soils are found throughout this variation, but stony/soils are crossed only once near the terminus of this variation.

Minerals

Table 3-31 presents the miles crossed by mineral resources for all alternative routes and route variations in Segment 6.

Table 3-31. Minerals Inventory Data for Segment 6—Treasure Valley (miles crossed)				
Alternative Route	**Total Length (miles)**	**Active Mine or Active Mining Claims**	**All Leases**	**Producing Oil and Gas or Geothermal Wells**
Applicant's Proposed Action	28.0	4.3	0.0	0.0
Variation S5-A1	*9.3*	*2.3*	*0.0*	*0.0*
Variation S5-A2	*8.9*	*1.9*	*0.0*	*0.0*
Variation S5-B1	*14.4*	*2.0*	*0.0*	*0.0*
Variation S5-B2	*14.1*	*1.7*	*0.0*	*0.0*
Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.				

The Applicant's Proposed Action Alternative for Segment 6 crosses 4.3 miles of active mines and mining claims. These occur near the Oregon/Idaho state line. There are no leases or producing wells crossed by the Applicant's Proposed Action Alternative for Segment 6.

Variation S6-A1

This variation crosses 2.3 miles of active mines and mining claims. These occur near the Oregon/Idaho state line. There are no leases or producing wells crossed by this variation.

Variation S6-A2

This variation crosses 1.9 miles of active mines and mining claims. These occur near the Oregon/Idaho state line. There are no leases or producing wells crossed by this variation.

Variation S6-B1

This variation crosses 2.0 miles of active mines and mining claims. These occur near the Oregon/Idaho state line. There are no leases or producing wells crossed by this variation.

Variation S6-B2

This variation crosses 1.7 miles of active mines and mining claims. These occur near the Oregon/Idaho state line. There are no leases or producing wells crossed by this variation.

Paleontological Resources

Table 3-32 presents the miles crossed by paleontological resources for all alternative routes and route variations in Segment 6.

Table 3-32. Paleontological Resources Inventory Data for Segment 6—Treasure Valley						
Alternative Route	**Total Length (miles)**	**Potential Fossil Yield Classification (miles crossed)**				
		1	**2**	**3**	**4**	**5**
Applicant's Proposed Action	28.0	7.8	2.9	14.5	2.8	0.0
Variation S6-A1	*9.3*	*3.5*	*0.0*	*3.7*	*2.1*	*0.0*
Variation S6-A2	*8.9*	*2.2*	*0.0*	*4.7*	*2.0*	*0.0*
Variation S6-B1	*14.4*	*4.3*	*0.6*	*9.5*	*0.0*	*0.0*
Variation S6-B2	*14.1*	*5.5*	*0.4*	*8.2*	*0.0*	*0.0*

The Applicant's Proposed Action Alternative for Segment 6 crosses 2.8 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 14.5 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S6-A1

This variation crosses 2.1 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 3.7 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S6-A2

This variation crosses 2.0 miles of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 4.7 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S6-B1

This variation crosses 0.0 mile of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 9.5 miles of geologic units with a moderate sensitivity (PFYC 3).

Variation S6-B2

This variation crosses 0.0 mile of geologic units with a high sensitivity (PFYC 4) for paleontological resources and 8.2 miles of geologic units with a moderate sensitivity (PFYC 3).

3.2.1.6 Environmental Consequences (Results of Analysis)

Types of Potential Effects

After compiling the resource inventory for earth resources, the methods for assessing the potential impacts on the B2H Project include (1) identifying the types of potential impacts from the B2H Project, (2) developing criteria for assessing the level of potential impacts from the B2H Project on earth resources, (3) classifying the level of impacts (high, moderate, or low), (4) assessing the initial impacts from the B2H Project, (5) identifying the appropriate selective mitigation measures for minimizing adverse effects, (6) determining specific areas where selective mitigation should be applied, and (7) disclosing potential residual impacts from the B2H Project on earth resources.

Geologic Hazards

The B2H Project would not be anticipated to affect faults or cause earthquakes; however, the B2H Project could be affected by them. Ground shaking and displacement related to earthquakes may damage human-made structures, including transmission lines and substations, which could result in interruption of power and injury to those in the vicinity of the structural damage. The damage to structures caused by earthquakes is highly variable and based on many features, including, but not limited to, types of building materials, quality of construction, distance from the epicenter, earthquake magnitude, and the susceptibility of underlying rock and soil at the site to ground shaking. Therefore, the relationship between the potential for structural damage and distance from earthquake epicenter is only an estimate. However, certain areas are subject to more earthquakes than others and the geographic distribution of earthquakes is considered in the analysis.

The B2H Project potentially could contribute to destabilization of slopes or the reactivation of known landslide deposits. Construction of transmission lines and associated facilities could negatively affect, and be negatively affected by, landslides. Blasting operations, particularly in areas of shallow bedrock, could precipitate landslides in already unstable areas. The potential for landslides partially depends on slope—steep slopes generally having greater potential for landslides than shallow slopes. Other landslide risk factors include the presence of expansive clay minerals; the presence of springs and seeps; and remnant geologic features in the slope profile such as bedding planes. Construction activities can result in human-caused landslides in landslide-prone areas. Removing soil at the base of an unstable slope can decrease slope stability and result in a landslide. Excavation or blasting in geologic hazard areas at substations and transmission tower sites or during road building could destabilize slopes, resulting in landslides, soil erosion, and stream sedimentation. Mid-slope road construction, concentration of drainage water on unstable ground, and removal of vegetation during construction also could trigger landslides (Centers for Disease Control and Prevention n.d.).

Foundations for transmission line towers can be up to 30 feet below ground surface. Construction in areas of shallow bedrock may require blasting. The vibrations generated by blasting also could result in slope instability, damage to nearby structures, damage to water wells, and disturbance to wildlife.

In summary, potential direct effects include direct loss of equipment or injury to personnel as a result of seismic activity or landslides, especially in steep terrain. Potential indirect effects on the operation of the B2H Project could include loss of transmission services as a result of seismic activity or landslides. Also, the construction of the B2H Project could directly or indirectly affect areas with high and moderate landslide susceptibility. A potential direct effect includes the removal of soils and sediments in areas with moderate to high landslide susceptibility. A potential indirect effect is the removal of vegetation, which could affect slope stability.

Soils

The construction, operation, and maintenance of the B2H Project would result in both direct and indirect effects on soils. Direct effects associated with construction activities could include the following:

- Accelerated soil erosion in areas where construction-related activities have disturbed or altered the land surface by exposing soils (temporary)
- Accelerated soil erosion in areas where construction-related activities have altered the contours of the land surface (temporary)
- Loss of designated Prime or Unique Farmland soils (i.e., conversion to nonagricultural uses) (permanent) (refer to Section 3.2.7)
- Compaction of soil resources by construction vehicles, equipment, and facilities (temporary)

Potential direct effects associated with the operation of and presence of the transmission line and associated facilities, or maintenance activities associated with the B2H Project include soil compaction by maintenance vehicles along permanent access roads.

Indirect effects associated with the construction, operation, and maintenance of the B2H Project could include the following:

- Construction of permanent access roads that could be used by the general public to access currently inaccessible areas, potentially resulting in accelerated erosion by water or wind (permanent)
- Degradation of the land surface and loss of soil productivity resulting from accelerated soil erosion (temporary to permanent)

Compaction could result in the loss of soil structure, possibly leading to a decrease in water infiltration rates, soil loss, or environmental degradation (e.g., the establishment of noxious weeds in disturbed areas). In general, overland movement of construction equipment during moist conditions is the primary cause of soil compaction. However, compaction also could occur where new access roads are constructed and at tower sites.

Minerals

Short-term effects on mineral resources could include restriction of exploration for mineral resources or access to existing mines during the construction period. The presence of existing mineral claims and leases could interfere with plans to construct the B2H Project. As part of the preconstruction process, the Applicant would identify mineral claims and leases and either negotiate permission to use the land surface in these areas or relocate the transmission line to avoid existing claims and leases. Where access to mineral resources may be restricted, the Applicant would provide compensation for damage, access rights, and easements with mine owners, claimants, and leaseholders. If necessary, the Applicant would provide mine operators with mine access across the B2H Project area during the construction phase of three years.

Construction of the B2H Project would result in the need for salable minerals, including fill material for grade changes, sand and gravel for concrete production, and gravel for roadbeds and similar uses. The use of salable minerals would provide an economic benefit to local mineral providers but also would result in consumption of materials that would not be available for other uses; therefore, this use would be an irretrievable commitment of resources.

Long-term effects during B2H Project operations could restrict the operation of new mining activities in the transmission line right-of-way. The B2H Project operations area is smaller than the construction disturbance area, but the time interval is much longer: 50 years for operations, compared to about 3 years for construction. B2H Project operations could result in mineral resources not being accessible for mining in the right-of-way for the life of the B2H Project.

Paleontological Resources

The construction, operation, and maintenance of the B2H Project could result in both direct and indirect adverse effects on paleontological resources. Potential direct effects associated with construction activities could include the loss of paleontological resources as a result of ground-disturbing activities, such as excavation; blasting; and construction of facilities, including staging areas; and road

construction or improvement. Potential loss of paleontological resources could occur during maintenance of the B2H Project if trucks or vehicles drive in areas where geologic units are recently exposed due to erosion. There are no foreseeable direct effects on paleontological resources from operation of the facilities and the presence of the transmission.

Indirect effects associated with the construction, operation, and maintenance of the B2H Project could include loss of paleontological resources resulting from increases in the following:

- Access of the general public to sensitive geologic units and unauthorized collection or vandalism from construction of permanent access roads
- Erosion associated with ground-disturbing activities that expose new fossils

BLM's consultation with Native American sovereign tribal governments has indicated that paleontological resources are an integral part of the spiritual landscape. Disruption of intact fossil beds, regardless of species and/or associated time period, may be considered an impact on sacred resources.

No Action Alternative

If the B2H Project is not authorized, there would be no adverse effects on soils in the B2H Project area, nor any adverse effects on mineral exploration and production. There would likewise be no adverse direct or indirect effects on paleontological resources.

Common to All Alternatives

Direct effects on earth resources resulting from the geotechnical drilling would be minimal, as geotechnical testing sites would be 8 inches in diameter. This size of geotechnical testing sites is too small to significantly affect earth resources. For example, due to the limited extent of disturbance, drilling associated with the geotechnical study would result in only minor effects on soils resources within the Project area; whereas the use of overland access routes could be more likely to result in impacts on soil resources. Effects associated with the geotechnical study would be short term, however, and would decrease to acceptable levels over time with the design features of the B2H Project for environmental protection in Table 2-7 and the selective mitigation measures in Table 2-13. Soil resources would be directly affected by onsite drilling and the use of overland access roads for drilling equipment and support vehicles to reach the drilling sites. These activities could crush or clear vegetative cover, compact soils, possibly result in rutting, and could indirectly increase local soil susceptibility to water and wind erosion. An increase in unauthorized OHV use along access roads could increase the time required to return the access routes to a natural state by limiting the effectiveness of revegetation efforts, compacting soil, and increase soil susceptibly to water and wind erosion.

Any ground disturbance associated with overland travel in areas with a PFYC of 4 or higher would have a greater potential for impacting paleontological resources and, therefore the areas would require mitigation, which would include monitoring during the geotechnical investigation. Testing sites and overland access routes would be evaluated for the presence of paleontological resources by a qualified

paleontologist prior to the geotechnical investigation. A possible indirect effect could be the potential for a temporary increase in public access to these areas using overland access routes and the associated possibility of unauthorized collection or vandalism of paleontological resources. However, such incidences would be localized and rare.

No effects of the geotechnical investigation on mineral resources or geological hazards would be anticipated.

SEGMENT 1—MORROW-UMATILLA

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-33 presents the residual impacts on geologic hazards for the B2H Project in Segment 1.

Table 3-33. Geologic Hazards Inventory Data and Residual Impacts on Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]		Residual Impacts (miles crossed)		
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84	Low	Moderate	High
Applicant's Proposed Action	91.9	0.1	0.0	0.0	91.9	0.0	91.9	0.0	0.0
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.1	0.0	0.0	92.3	0.0	92.3	0.0	0.0
Applicant's Proposed Action – Southern Route	99.1	0.1	0.0	0.0	99.1	0.0	99.1	0.0	0.0
West of Bombing Range Road – Southern Route	95.6	0.1	0.0	0.0	95.6	0.0	95.6	0.0	0.0
Longhorn	88.2	0.1	0.0	0.0	88.2	0.0	88.2	0.0	0.0
Interstate 84	84.7	0.1	0.0	0.0	84.7	0.0	84.7	0.0	0.0
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.1	0.0	0.0	93.4	0.0	93.4	0.0	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 1.

Following implementation of the design features for environmental protection and selective mitigation measures (Section 2.3.4 and Table 2-13), the Proposed Action would have 0.1 mile of moderate residual impacts on geologic hazards, associated with faults. Variations S1-B1 and S1-B2 would have low residual impacts.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The residual impacts on the additional action are the same as the Applicant's Proposed Action Alternative.

Soils

Table 3-34 presents the residual impacts on soil resources for all alternative routes and route variations in Segment 1.

Table 3-34. Soils Inventory Data and Residual Impacts on Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)								Residual Impacts (miles crossed)
		Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]		
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate	Low
Applicant's Proposed Action	91.9	8.3	50.9	32.7	0.0	91.6	0.3	89.6	2.3	91.9
Variation S1-B1	*6.4*	*0.0*	*3.1*	*3.3*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*
Variation S1-B2	*6.4*	*0.0*	*4.0*	*2.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*
East of Bombing Range Road	92.3	8.3	52.7	31.3	0.0	92.0	0.3	90.0	2.3	92.3
Applicant's Proposed Action – Southern Route	99.1	9.5	58.0	31.6	0.0	98.8	0.3	94.7	4.4	99.1
West of Bombing Range Road – Southern Route	95.6	9.5	50.2	35.9	0.0	95.2	0.4	87.9	7.7	95.6
Longhorn	88.2	8.3	50.4	29.5	0.0	80.9	7.3	85.9	2.3	88.2
Interstate 84	84.7	8.3	57.7	18.7	0.0	78.8	5.9	82.4	2.3	84.7
Variation S1-A1	*18.5*	*0.0*	*16.3*	*2.2*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*	*18.5*
Variation S1-A2	*18.5*	*0.0*	*5.9*	*12.6*	*0.0*	*18.3*	*0.2*	*18.5*	*0.0*	*18.5*
Interstate 84 – Southern Route	93.4	9.5	66.1	17.8	0.0	87.5	5.9	89.0	4.4	93.4

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

Following implementation of the design features for environmental protection and selective mitigation measures, the Applicant's Proposed Action Alternative would have only low residual impacts on soil

resources. The residual impacts on soil resources for Variations S1-B1 and S1-B2 would be the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The residual impacts on the additional action would be the same as the Applicant's Proposed Action Alternative.

Minerals

Table 3-35 presents the residual impacts on mineral resources for the B2H Project in Segment 1.

Table 3-35. Minerals Inventory Data and Residual Impacts on Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)[1]			Residual Impacts (miles crossed)		
		Active Mine or Active Mining Claims	All Leases	Producing Oil and Gas or Geothermal Wells	None	Low	Moderate
Applicant's Proposed Action	91.9	0.0	0.0	0.0	91.9	0.0	0.0
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	2.0	0.0	90.3	0.0	2.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	0.0	99.1	0.0	0.0
West of Bombing Range Road – Southern Route	95.6	0.0	0.5	0.0	95.1	0.0	0.5
Longhorn	88.2	0.0	2.9	0.0	85.3	0.0	2.9
Interstate 84	84.7	0.0	0.4	0.0	84.3	0.0	0.4
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	0.4	0.0	93.0	0.0	0.4

Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action Applicant's Proposed Action Alternative would only have low residual impacts on mineral resources. The residual impacts on mineral resources for Variations S1-B1 and S1-B2 would be the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The residual impacts on the additional action would be the same as the Applicant's Proposed Action Alternative.

Paleontological Resources

Table 3-36 presents the residual impacts on paleontological resources for the B2H Project in Segment 1.

Table 3-36. Paleontological Resources Inventory Data and Residual Impacts on Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)					Residual Impacts (miles crossed)
		1	2	3	4	5	Low
Applicant's Proposed Action	91.9	0.0	61.3	10.8	19.8	0.0	91.9
Variation S1-B1	*6.4*	*0.0*	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*
Variation S1-B2	*6.4*	*0.0*	*6.4*	*0.0*	*0.0*	*0.0*	*6.4*
East of Bombing Range Road	92.3	0.0	61.3	10.8	20.2	0.0	92.3
Applicant's Proposed Action – Southern Route	99.1	0.0	72.1	10.8	16.2	0.0	99.1
West of Bombing Range Road – Southern Route	95.6	0.0	71.4	10.8	13.4	0.0	95.6
Longhorn	88.2	0.0	61.3	13.2	13.7	0.0	88.2
Interstate 84	84.7	0.0	58.2	22.9	3.6	0.0	84.7
Variation S1-A1	*18.5*	*0.0*	*12.6*	*5.9*	*0.0*	*0.0*	*18.5*
Variation S1-A2	*18.5*	*0.0*	*14.0*	*4.5*	*0.0*	*0.0*	*18.5*
Interstate 84 – Southern Route	93.4	0.0	70.5	22.9	0.0	0.0	93.4

Following implementation of the design features (Section 2.3.4) and Selective Mitigation Measure 8, there would only be low residual impacts on paleontological resources. The residual impacts on paleontological resources for Variations S1-B1 and S1-B2 would be the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The residual impacts on paleontological resources would be the same as the Applicant's Proposed Action Alternative.

East of Bombing Range Road Alternative

Geologic Hazards

The residual impacts would be the same as those for the Applicant's Proposed Action Alternative.

Soils

The residual impacts would be similar to those for the Applicant's Proposed Action Alternative but with less (0.4 mile) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, this alternative route would have 2.0 miles of moderate residual impacts associated with leases.

Paleontological Resources

The residual impacts would be similar to those for the Applicant's Proposed Action Alternative but with more (0.4 mile more) low residual impacts.

Applicant's Proposed Action – Southern Route Alternative

Geologic Hazards

The residual impacts would be the same as those of the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would have the same residual impacts from geologic hazards as those of the Applicant's Proposed Action Alternative.

Soils

The Southern Route Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with more (7.2 miles more) low residual impacts.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would have the same residual impacts on soils as those of the Applicant's Proposed Action Alternative.

Minerals

The Southern Route Alternative would have the same residual impacts on mineral resources as those of the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would have the same residual impacts on mineral resources as those of the Applicant's Proposed Action Alternative.

Paleontological Resources

The Southern Route Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (7.2 miles more) low residual impacts.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would have the same residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

Geologic Hazards

The West of Bombing Range Road – Southern Alternative would have the same residual impacts from geologic hazards as those of the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would have the same residual impacts from geologic hazards as those of the Applicant's Proposed Action Alternative.

Soils

The West of Bombing Range Road – Southern Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with more (3.7 miles more) low residual impacts.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The impacts on soils would be the same as those of the Applicant's Proposed Action Alternative.

Minerals

Following the implementation of design features for environmental protection and selective mitigation measures, the alternative route would have 0.5 mile of moderate residual impacts associated with leases.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would have the same residual impacts on mineral resources as those of the Applicant's Proposed Action Alternative.

Paleontological Resources

The West of Bombing Range Road – Southern Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (3.7 more miles) low residual impacts.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would have the same residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative.

Longhorn Alternative

Geologic Hazards

The Longhorn Alternative would have the same residual impacts from geologic hazards as those of the Applicant's Proposed Action Alternative.

Soils

The Longhorn Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with less (3.7 miles less) low residual impacts.

Minerals

Following the implementation of design features for environmental protection and selective mitigation measures, the alternative route would have 2.9 miles of moderate residual impacts associated with leases.

Paleontological Resources

The Longhorn Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with less (3.7 miles less) low residual impacts.

Interstate 84 Alternative

Geologic Hazards

The Interstate 84 Alternative would have the same residual impacts from geologic hazards as those of the Applicant's Proposed Action Alternative. Variations S1-A1 and S1-A2 would have low residual impacts from geologic hazards.

Soils

The Interstate 84 Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with less (7.2 miles less) low residual impacts. The residual impacts on soils for Variations S1-A1 and S1-A2 would be the same as the Interstate 84 Alternative.

Minerals

Following the implementation of design features for environmental protection and selective mitigation measures, the alternative route would have 0.4 mile of moderate residual impacts associated with leases. Variations S1-B1 and S1-B2 would have no residual impacts on mineral resources.

Paleontological Resources

The Interstate 84 Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with less (7.2 miles less) low residual impacts.

The residual impacts on paleontological resources for Variations S1-B1 and S1-B2 would be the same as the Interstate 84 Alternative.

Interstate 84 – Southern Route Alternative

Geologic Hazards

The Interstate 84 – Southern Route Alternative would have the same residual impacts from geologic hazards as the Applicant's Proposed Action Alternative.

Soils

The Interstate 84 – Southern Route Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with more (1.5 more miles) low residual impacts.

Minerals

Following the implementation of design features for environmental protection and selective mitigation measures for the B2H Project, the alternative route would have 0.4 mile of moderate residual impacts associated with leases.

Paleontological Resources

The Interstate 84 – Southern Route Alternative would have similar residual impacts on paleontological resources as the Applicant's Proposed Action Alternative but with more (1.5 more miles) low residual impacts.

Conclusion

In Segment 1, the B2H Project would not cross recent Quaternary faults or areas with moderate or high landslide potential. Thus, impacts on the B2H Project from geological hazards would not be likely to occur during the life of the Project. All alternative routes considered cross soils with moderate potential for water and wind erosion and soil compaction. However, with implementation of the selective mitigation measures (refer to Section 3.2.1.4), residual impacts would be low for any route selected.

No active mines are crossed by alternative routes analyzed in Segment 1. But, with the exception of the Applicant's Proposed Action Alternative and the Applicant's Proposed Action – Southern Route Alternative, some existing leases are crossed. Moderate effects including restriction of exploration for mineral resources or access to existing mines during the construction period could occur where alternative routes analyzed cross existing leases or claims. As part of the preconstruction process, the Applicant would identify mineral claims and leases and either negotiate permission to use the land surface in these areas or relocate the transmission line to avoid existing claims and leases. Where access to mineral resources may be restricted, the Applicant would provide compensation for damage, access rights, and easements with mine owners, claimants, and leaseholders. If necessary, the Applicant would provide mine operators with mine access across the B2H Project area during construction. The Longhorn Alternative would have the greatest effect on mineral resources (2.9 miles of moderate effects). Other alternative routes would have moderate effects ranging from zero to 0.5 miles.

With the exception of the Interstate 84 – Southern Route Alternative, all alternative routes analyzed in Segment 1 cross geological units with high sensitivity for paleontological resources. However, with implementation of the selective mitigation measures (refer to Section 3.2.1.4), preconstruction surveys on the selected route, and development of a PRTP, residual impacts would be low for any route selected.

SEGMENT 2—BLUE MOUNTAINS

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-37 presents the residual impacts on geologic hazards for all alternative routes and route variations in Segment 2.

Table 3-37. Geologic Hazards Inventory Data and Residual Impacts on Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]		Residual Impacts (miles crossed)		
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84	Low	Moderate	High
Applicant's Proposed Action	33.8	0.0	0.0	0.0	33.8	0.0	33.8	0.0	0.0
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*12.1*	*0.0*	*12.1*	*0.0*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*0.0*
Glass Hill	33.7	0.0	0.0	0.0	33.7	0.0	33.7	0.0	0.0
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*0.0*
Mill Creek	34.0	0.0	0.0	1.0	34.0	0.0	33.0	1.0	0.0

Table Notes:

[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.

[2]There were no areas with high landslide percentile for Segment 2.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have no residual impacts from geologic hazards. All variations of the Proposed Action would have the same residual impacts from geologic hazards.

Soils

Table 3-38 presents the residual impacts on soil resources for all alternative routes and route variations in Segment 2.

Table 3-38. Soils Inventory Data and Residual Impacts on Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)								Residual Impacts (miles crossed)
		Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]		
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate	Low
Applicant's Proposed Action	33.8	9.9	19.6	4.3	0.1	33.7	0.0	29.9	3.9	33.8
Variation S2-A1	*2.8*	*0.3*	*2.3*	*0.2*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*
Variation S2-A2	*2.9*	*0.2*	*2.2*	*0.5*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*
Variation S2-B1	*3.7*	*2.0*	*1.5*	*0.2*	*0.0*	*3.7*	*0.0*	*3.5*	*0.2*	*3.7*
Variation S2-B2	*3.8*	*1.9*	*1.6*	*0.3*	*0.0*	*3.8*	*0.0*	*3.6*	*0.2*	*3.8*
Variation S2-C1	*9.3*	*5.6*	*2.4*	*1.3*	*0.0*	*9.3*	*0.0*	*7.8*	*1.5*	*9.3*
Variation S2-C2	*8.8*	*5.1*	*3.5*	*0.2*	*0.0*	*8.8*	*0.0*	*7.9*	*0.9*	*8.8*
Variation S2-E1	*2.3*	*0.8*	*1.5*	*0.0*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*
Variation S2-E2	*2.6*	*0.6*	*1.9*	*0.1*	*0.0*	*2.6*	*0.0*	*2.3*	*0.3*	*2.6*
Variation S2-F1	*12.1*	*0.1*	*9.9*	*2.1*	*0.1*	*12.0*	*0.0*	*9.9*	*2.2*	*12.1*
Variation S2-F2	*12.2*	*0.0*	*11.0*	*1.2*	*0.0*	*12.2*	*0.0*	*10.1*	*2.1*	*12.2*
Glass Hill	33.7	9.0	21.5	3.2	0.1	33.6	0.0	31.1	2.6	33.7
Variation S2-D1	*4.3*	*3.1*	*0.8*	*0.4*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*
Variation S2-D2	*4.1*	*2.5*	*0.9*	*0.7*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*
Mill Creek	34.0	4.4	26.6	3.0	0.0	34.0	0.0	30.5	3.5	34.0

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have only low residual impacts on soils. All variations of the Proposed Action would have the same residual impacts on soils.

Minerals

Table 3-39 presents the residual impacts on mineral resources for all alternative routes and route variations in Segment 1.

Table 3-39. Minerals Inventory Data and Residual Impacts on Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)			Residual Impacts (miles crossed)		
		Active Mine or Active Mining Claims (miles crossed)	All Leases (miles crossed)	Producing Oil and Gas or Geothermal Wells (miles crossed)	None	Low	Moderate
Applicant's Proposed Action	33.8	0.0	0.0	0.0	33.8	0.0	0.0
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*2.9*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*3.7*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*3.8*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*9.3*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*8.8*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*2.6*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*2.6*	*0.0*	*0.0*
Glass Hill	33.7	*0.0*	*0.0*	*0.0*	*12.1*	*0.0*	*0.0*
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*12.2*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*33.7*	*0.0*	*0.0*
Mill Creek	34.0	*0.0*	*0.0*	*0.0*	34.0	0.0	0.0

Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have no residual impacts on mineral resources. All variations of the Proposed Action would have the same residual impacts on mineral resources.

Paleontological Resources

Table 3-40 presents the residual impacts on paleontological resources for all alternative routes and route variations in Segment 2.

Table 3-40. Paleontological Resources Inventory Data and Residual Impacts on Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)					Residual Impacts (miles crossed)
		1	2	3	4	5	Low
Applicant's Proposed Action	33.8	16.7	17.1	0.0	0.0	0.0	33.8
Variation S2-A1	*2.8*	*0.0*	*2.8*	*0.0*	*0.0*	*0.0*	*2.8*
Variation S2-A2	*2.9*	*0.0*	*2.9*	*0.0*	*0.0*	*0.0*	*2.9*
Variation S2-B1	*3.7*	*1.2*	*2.5*	*0.0*	*0.0*	*0.0*	*3.7*
Variation S2-B2	*3.8*	*1.6*	*2.2*	*0.0*	*0.0*	*0.0*	*3.8*
Variation S2-C1	*9.3*	*8.4*	*0.9*	*0.0*	*0.0*	*0.0*	*9.3*
Variation S2-C2	*8.8*	*5.8*	*2.1*	*0.9*	*0.0*	*0.0*	*8.8*

Table 3-40. Paleontological Resources Inventory Data and Residual Impacts on Segment 2—Blue Mountains							
Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)					Residual Impacts (miles crossed)
		1	2	3	4	5	Low
Variation S2-E1	*2.3*	*0.7*	*1.6*	*0.0*	*0.0*	*0.0*	*2.3*
Variation S2-E2	*2.6*	*1.0*	*1.6*	*0.0*	*0.0*	*0.0*	*2.6*
Variation S2-F1	*12.1*	*6.1*	*6.0*	*0.0*	*0.0*	*0.0*	*12.1*
Variation S2-F2	*12.2*	*7.5*	*4.7*	*0.0*	*0.0*	*0.0*	*12.2*
Glass Hill	33.7	15.6	18.1	0.0	0.0	0.0	33.7
Variation S2-D1	*4.3*	*4.1*	*0.2*	*0.0*	*0.0*	*0.0*	*4.3*
Variation S2-D2	*4.1*	*4.0*	*0.1*	*0.0*	*0.0*	*0.0*	*4.1*
Mill Creek	34.0	19.0	15.0	0.0	0.0	0.0	34.0

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Proposed Action would have only low residual impacts on paleontological resources. All variations of the Proposed Action would have the same residual impacts on paleontological resources.

Glass Hill Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Glass Hill Alternative would have the same residual impacts from geologic hazards as the Applicant's Proposed Action Alternative. All Variations of this Alternative would have the same residual impacts from geologic hazards.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Glass Hill Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with less (0.9 less miles) low residual impacts. All Variations of the alternative would have the same residual impacts on soils.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Glass Hill Alternative would have the same residual impacts on mineral resources as the Applicant's Proposed Action Alternative. All variations of the Proposed Action would have the same residual impacts on mineral resources.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Glass Hill Alternative would have the same residual impacts on paleontological resources as the Applicant's Proposed Action Alternative but with less (0.9 less miles)

low residual impacts. All variations of the Proposed Action would have the same residual impacts on paleontological resources.

Mill Creek Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Mill Creek Alternative would have 1.0 mile of high residual impacts from geologic hazards associated with recent Quaternary faults.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Mill Creek Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with more (0.2 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Mill Creek Alternative would have the same residual impacts on mineral resources as the Applicant's Proposed Action Alternative.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Mill Creek Alternative would have the same residual impacts on paleontological resources as the Applicant's Proposed Action Alternative but with more (0.2 more miles) low residual impacts.

Conclusion

In Segment 2, the Project would cross one Quaternary fault on the Mill Creek Alternative. The Applicant's Proposed Action or other alternatives do not cross any other geological hazards. Thus, the impacts on the B2H project from geological hazards would not be likely to occur during the life of the Project. All alternative routes considered cross some small areas with moderate susceptibility to water erosion, and compaction. The Applicants Proposed Action Alternative would have the greatest impact on soils with moderate susceptibility to water erosion and compaction. The Mill Creek Alternative would have the least impact on soils with moderate susceptibility to water erosion. The Glass Hill Alternative would have the least impact to soils with moderate susceptibility for compaction. However, with implementation of the selective mitigation measures (refer to Section 3.2.1.4), residual impacts would be low for any route selected.

The Project would not cross any mineral resources in Segment 2.

The Project would not cross any geological units with moderate or high sensitivity for paleontological resources.

SEGMENT 3—BAKER VALLEY

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-41 presents the residual impacts on geologic hazards for all alternative routes and route variations in Segment 3.

Table 3-41. Geologic Hazards Inventory Data and Residual Impacts on Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]		Residual Impacts (miles crossed)		
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84	Low	Moderate	High
Applicant's Proposed Action	55.2	0.6	0.0	0.0	55.2	0.0	55.2	0.0	0.0
Variation S3-A1	*12.4*	*0.1*	*0.0*	*0.0*	*12.4*	*0.0*	*12.4*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.8*	*0.0*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0.5*	*0.0*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*1.0*	*0.0*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*0.9*	*0.0*	*0.0*	*14.7*	*0.0*	*14.7*	*0.0*	*0.0*
Variation S3-B4	*14.3*	*0.9*	*0.0*	*0.0*	*14.3*	*0.0*	*14.3*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*1.1*	*0.0*	*0.0*	*14.0*	*0.0*	*14.0*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*21.1*	*0.0*	*21.1*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*21.7*	*0.0*	*21.7*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*21.1*	*0.0*	*21.1*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*21.4*	*0.0*	*21.4*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*21.0*	*0.0*	*21.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*0.0*
Flagstaff A	55.3	1.2	0.0	0.0	55.3	0.0	55.3	0.0	0.0
Timber Canyon	70.3	0.0	0.0	0.0	68.7	1.6	70.3	0.0	0.0
Flagstaff A – Burnt River Mountain	55.3	1.2	0.0	0.0	55.3	0.0	55.3	0.0	0.0
Flagstaff B	56.0	1.0	0.0	0.0	56.0	0.0	56.0	0.0	0.0
Flagstaff B – Burnt River West	55.7	1.7	0.0	0.0	55.7	0.0	55.7	0.0	0.0
Flagstaff B – Durkee	59.6	1.0	0.0	0.0	59.6	0.0	59.6	0.0	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 3

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would 0.6 mile of moderate residual impacts from geologic hazards associated with older Quaternary faults. All variations of the Proposed Action would have the same residual impacts from geologic hazards.

Variation S3-A1

This variation would have 0.1 mile of moderate residual impacts from geologic hazards.

Variation S3-A2

This variation would have 0.8 mile of moderate residual impacts from geologic hazards.

Variation S3-B1

This variation would have 0.5 mile of moderate residual impacts from geologic hazards.

Variation S3-B2

This variation would have 1.0 mile of moderate residual impacts from geologic hazards.

Variation S3-B3

This variation would have 0.9 mile of moderate residual impacts from geologic hazards.

Variation S3-B4

This variation would have 0.9 mile of moderate residual impacts from geologic hazards.

Variation S3-B5

This variation would have 1.1 miles of moderate residual impacts from geologic hazards.

Variations S3-C1 through S3-C6

These variations would have no moderate or high residual impacts from geologic hazards.

Soils

Table 3-42 presents the residual impacts on soil resources for all alternative routes and route variations in Segment 3.

Table 3-42. Soils Inventory Data and Residual Impacts on Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)								Residual Impacts (miles crossed)
		Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]		
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate	Low
Applicant's Proposed Action	55.2	0.0	43.2	12.0	0.0	52.2	3.0	49.1	6.1	55.2
Variation S3-A1	*12.4*	*0.0*	*11.9*	*0.5*	*0.0*	*12.4*	*0.0*	*11.0*	*1.4*	*12.4*
Variation S3-A2	*12.2*	*0.0*	*12.2*	*0.0*	*0.0*	*12.2*	*0.0*	*9.3*	*2.9*	*12.2*
Variation S3-B1	*13.9*	*0.0*	*10.5*	*3.4*	*0.0*	*13.9*	*0.0*	*12.6*	*1.3*	*13.9*

Table 3-42. Soils Inventory Data and Residual Impacts on Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)								Residual Impacts (miles crossed)
		Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]		
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate	Low
Variation S3-B2	*14.4*	*0.0*	*13.1*	*1.3*	*0.0*	*14.4*	*0.0*	*12.5*	*1.9*	*14.4*
Variation S3-B3	*14.7*	*0.0*	*13.3*	*1.4*	*0.0*	*14.7*	*0.0*	*13.2*	*1.5*	*14.7*
Variation S3-B4	*14.3*	*0.0*	*12.4*	*1.9*	*0.0*	*14.3*	*0.0*	*13.4*	*0.9*	*14.3*
Variation S3-B5	*14.0*	*0.0*	*12.2*	*1.8*	*0.0*	*14.0*	*0.0*	*12.8*	*1.2*	*14.0*
Variation S3-C1	*21.1*	*0.0*	*14.1*	*7.0*	*0.0*	*18.1*	*3.0*	*19.3*	*1.8*	*21.1*
Variation S3-C2	*21.7*	*0.0*	*15.7*	*6.0*	*0.0*	*18.9*	*2.8*	*19.8*	*1.9*	*21.7*
Variation S3-C3	*21.1*	*0.1*	*16.5*	*4.5*	*0.0*	*21.0*	*0.1*	*15.5*	*5.6*	*21.1*
Variation S3-C4	*21.4*	*0.0*	*16.7*	*4.7*	*0.0*	*21.4*	*0.0*	*16.0*	*5.4*	*21.4*
Variation S3-C5	*21.0*	*0.8*	*17.0*	*3.2*	*0.0*	*21.0*	*0.0*	*16.8*	*4.2*	*21.0*
Variation S3-C6	*24.7*	*2.3*	*18.8*	*3.6*	*0.0*	*24.7*	*0.0*	*20.5*	*4.2*	*24.7*
Flagstaff A	55.3	0.0	44.9	10.4	0.0	52.3	3.0	49.3	6.0	55.3
Timber Canyon	70.3	2.8	55.7	11.8	0.0	69.4	0.9	63.2	7.1	70.3
Flagstaff A – Burnt River Mountain	55.3	0.1	47.3	7.9	0.0	55.2	0.1	45.5	9.8	55.3
Flagstaff B	56.0	0.0	46.0	10.0	0.0	53.0	3.0	49.7	6.3	56.0
Flagstaff B – Burnt River West	55.7	0.8	49.2	5.7	0.0	55.7	0.0	45.5	10.2	55.7
Flagstaff B – Durkee	59.6	2.3	50.7	6.6	0.0	59.6	0.0	50.9	8.7	59.6

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have only low residual impacts on soils. The variations of the Proposed Action would have the same residual impacts on soils.

Minerals

Table 3-43 presents the residual impacts on mineral resources for all alternative routes and route variations in Segment 3.

Table 3-43. Minerals Inventory Data and Residual Impacts on Segment 3—Baker Valley							
Alternative Route	Total Length (miles)	Inventory Data (miles crossed)[1]			Residual Impacts (miles crossed)		
		Active Mine or Active Mining Claims (miles crossed)	All Leases (miles crossed)	Producing Oil and Gas or Geothermal Wells (miles crossed)	None	Low	Moderate
Applicant's Proposed Action	55.2	1.9	0.0	0.0	53.3	1.9	0.0
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*12.4*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*12.2*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*1.1*	*0.0*	*0.0*	*12.8*	*1.1*	*0.0*
Variation S3-B2	*14.4*	*0.3*	*0.0*	*0.0*	*14.1*	*0.3*	*0.0*
Variation S3-B3	*14.7*	*0.3*	*0.0*	*0.0*	*14.4*	*0.3*	*0.0*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.0*	*14.3*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*0.0*	*14.0*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*0.8*	*0.0*	*0.0*	*20.3*	*0.8*	*0.0*
Variation S3-C2	*21.7*	*1.8*	*0.0*	*0.0*	*19.9*	*1.8*	*0.0*
Variation S3-C3	*21.1*	*3.3*	*0.0*	*0.0*	*17.8*	*3.3*	*0.0*
Variation S3-C4	*21.4*	*3.3*	*0.0*	*0.0*	*18.1*	*3.3*	*0.0*
Variation S3-C5	*21.0*	*1.6*	*0.0*	*0.0*	*19.4*	*1.6*	*0.0*
Variation S3-C6	*24.7*	*4.2*	*0.0*	*0.0*	*20.5*	*4.2*	*0.0*
Flagstaff A	55.3	0.8	0.0	0.0	54.5	0.8	0.0
Timber Canyon	70.3	2.5	0.0	0.0	67.8	2.5	0.0
Flagstaff A – Burnt River Mountain	55.3	3.3	0.0	0.0	52.0	3.3	0.0
Flagstaff B	56.0	1.1	0.0	0.0	54.9	1.1	0.0
Flagstaff B – Burnt River West	55.7	1.9	0.0	0.0	53.8	1.9	0.0
Flagstaff B – Durkee	59.6	4.5	0.0	0.0	55.1	4.5	0.0
Table Note: Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.							

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would not have any moderate or high residual impacts on mineral resources. The variations for the Proposed Action would have the same residual impacts as the Proposed Action.

Paleontological Resources

Table 3-44 presents the residual impacts on paleontological resources for all alternative routes and route variations in Segment 3.

Table 3-44. Paleontological Resources Inventory Data and Residual Impacts on Segment 3—Baker Valley							
Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)					Residual Impacts (miles crossed)
		1	2	3	4	5	Low
Applicant's Proposed Action	55.2	13.4	21.9	4.8	15.1	0.0	55.2
Variation S3-A1	*12.4*	*9.9*	*2.5*	*0.0*	*0.0*	*0.0*	*12.4*
Variation S3-A2	*12.2*	*8.6*	*3.6*	*0.0*	*0.0*	*0.0*	*12.2*
Variation S3-B1	*13.9*	*2.8*	*9.3*	*0.0*	*1.8*	*0.0*	*13.9*
Variation S3-B2	*14.4*	*0.8*	*9.7*	*0.0*	*3.9*	*0.0*	*14.4*
Variation S3-B3	*14.7*	*0.8*	*9.5*	*0.0*	*4.4*	*0.0*	*14.7*
Variation S3-B4	*14.3*	*0.7*	*8.0*	*0.0*	*5.6*	*0.0*	*14.3*
Variation S3-B5	*14.0*	*0.7*	*9.3*	*0.0*	*4.0*	*0.0*	*14.0*
Variation S3-C1	*21.1*	*0.7*	*5.9*	*4.8*	*9.7*	*0.0*	*21.1*
Variation S3-C2	*21.7*	*0.8*	*6.6*	*4.8*	*9.5*	*0.0*	*21.7*
Variation S3-C3	*21.1*	*6.8*	*4.3*	*5.8*	*4.2*	*0.0*	*21.1*
Variation S3-C4	*21.4*	*7.1*	*5.4*	*5.8*	*3.1*	*0.0*	*21.4*
Variation S3-C5	*21.0*	*8.6*	*4.0*	*5.9*	*2.5*	*0.0*	*21.0*
Variation S3-C6	*24.7*	*10.6*	*4.7*	*5.8*	*3.6*	*0.0*	*24.7*
Flagstaff A	55.3	11.3	21.9	4.8	17.3	0.0	55.3
Timber Canyon	70.3	30.6	26.1	4.8	8.8	0.0	70.3
Flagstaff A – Burnt River Mountain	55.3	17.4	20.3	5.8	11.8	0.0	55.3
Flagstaff B	56.0	11.4	22.1	4.8	17.7	0.0	56.0
Flagstaff B – Burnt River West	55.7	18.0	21.3	5.9	10.5	0.0	55.7
Flagstaff B – Durkee	59.6	21.3	20.9	5.8	11.6	0.0	59.6

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Proposed Action would have only low residual impacts on paleontological resources. The variations of the Proposed Action would have similar residual impacts on paleontological resources.

Flagstaff A Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff A Alternative would have 1.2 miles of moderate residual impacts from geologic hazards associated with older Quaternary faults as the Applicant's Proposed Action Alternative.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff A Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with more (1.1 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff A Alternative would have similar residual impacts on mineral resources as the Applicant's Proposed Action Alternative but with less (1.1 less miles) low residual impacts.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Flagstaff A Alternative would have similar residual impacts on paleontological resources as the Applicant's Proposed Action Alternative but with more (1.1 more miles) low residual impacts.

Timber Canyon Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Timber Canyon Alternative would have no moderate or high residual impacts from geologic hazards.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Timber Canyon Alternative would have 15.1 more miles of low residual impacts on soils as the Applicant's Proposed Action Alternative.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Timber Canyon Alternative would have similar residual impacts on mineral resources as the Applicant's Proposed Action Alternative but with more (0.6 more miles) low residual impacts.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Timber Creek Alternative would have 15.1 more miles of low residual impacts on paleontological resources as the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff A Burnt River Mountain Alternative would have 1.2 miles of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff A Burnt River Mountain Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with more (0.1 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff A Burnt River Mountain Alternative would have similar residual impacts on mineral resources as the Applicant's Proposed Action Alternative but with more (1.4 more miles) of low residual impacts.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Flagstaff A Burnt River Mountain Alternative would have similar residual impacts on paleontological resources as the Applicant's Proposed Action Alternative but with more (0.1 more miles) low residual impacts.

Flagstaff B Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Alternative would have 1.0 mile of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with more (0.8 more miles) of low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Alternative would have similar residual impacts on mineral resources as those of the Applicant's Proposed Action Alternative but with less (0.8 less miles) of low residual impacts.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Flagstaff B Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (0.8 more miles) low residual impacts.

Flagstaff B – Burnt River West Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Burnt River West Alternative would have 1.7 miles of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Burnt River West Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with more (0.5 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Burnt River West Alternative would have the same residual impacts on mineral resources as those of the Applicant's Proposed Action Alternative.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Flagstaff B Burnt River West Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (0.5 more miles) low residual impacts.

Flagstaff B – Durkee Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Durkee Alternative would have 1.0 mile of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Durkee Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with more (4.4 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Flagstaff B Durkee Alternative would have similar residual impacts on mineral resources as those of the Applicant's Proposed Action Alternative but with more (2.6 more miles) low residual impacts.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Flagstaff B Durkee Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (4.4 more miles) of low residual impacts.

Conclusion

The Project would cross several older Quaternary faults, and the Timber Canyon Alternative is the only one which crosses an area in the moderate percentile for landslides. Thus, impacts on the B2H Project

from geological hazards would not be likely to occur during the life of the Project, or the chance of such impacts would be small. The Project does cross soils with moderate susceptibility wind and water erosion, and soil compaction. The Applicant's Proposed Action Alternative would have the greatest impact to soils with moderate susceptibility to water erosion, and the Flagstaff B (Durkee) Alternative would have the least. The Flagstaff B (Durkee) Alternative, Flagstaff B (Burnt River West) Alternative, and the Flagstaff A (Burnt River Mountain) Alterative would have the least impact to soils with moderate susceptibility to water erosion, and the Applicant's Proposed Action Alternative, Flagstaff A Alternative, and Flagstaff B Alternative would have the greatest impact to soils with moderate susceptibility to wind erosion. The Flagstaff B (Burnt River West) Alternative would have the greatest impact in soils with a moderate susceptibility for soil compaction, and the Applicant's Proposed Action Alternative and the Flagstaff A Alternative would have the least. However, with implementation of the selective mitigation measures (refer to Section 3.2.1.4), residual impacts would be low for any route selected.

Active Mines are present in Segment 3. The Flagstaff B (Durkee) Alternative would have the greatest impact to active mines, and the Flagstaff A Alternative would have the least. Moderate effects including restriction of exploration for mineral resources or access to existing mines during the construction period could occur where alternative routes analyzed cross existing leases or claims. As part of the preconstruction process, the Applicant would identify mineral claims and leases and either negotiate permission to use the land surface in these areas or relocate the transmission line to avoid existing claims and leases. Where access to mineral resources may be restricted, the Applicant would provide compensation for damage, access rights, and easements with mine owners, claimants, and leaseholders. If necessary, the Applicant would provide mine operators with mine access across the B2H Project area during construction. The Flagstaff B-Durkee Alternative would have the greatest effect on mineral resources (4.5 miles of active mines and mining claims), and the Flagstaff A Alternative would have the least (0.8 miles of active mines and mining claims.

All of the alternatives in Segment 3 cross geological units with a high sensitivity for paleontological resources. The Flagstaff B Alternative would have the highest impact on these geological units and the Timber Canyon Alternative would have the least.

SEGMENT 4—BROGAN

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-45 presents the residual impacts on geologic hazards for all alternative routes and route variations in Segment 4.

Table 3-45. Geologic Hazards Inventory Data and Residual Impacts on Segment 4—Brogan

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]		Residual Impacts (miles crossed)		
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84	Low	Moderate	High
Applicant's Proposed Action	40.1	0.4	0.0	0.8	40.1	0.0	39.3	0.0	0.8
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*0.0*
Tub Mountain South	40.5	0.0	0.0	0.1	40.5	0.0	40.4	0.0	0.1
Willow Creek	34.6	0.0	0.0	0.1	34.6	0.0	34.5	0.0	0.1

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 4

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have 0.8 mile of high residual impacts and 0.4 mile of moderate residual impacts from geologic hazards associated with Quaternary faults

Variations S4-A1 through S4-A3

These variations would have no residual impacts from geologic hazards.

Soils

Table 3-46 presents the residual impacts on soil resources for all alternative routes and route variations in Segment 4.

Table 3-46. Soils Inventory Data and Residual Impacts on Segment 4—Brogan										
Alternative Route	Total Length (miles)	Inventory Data (miles crossed)								Residual Impacts (miles crossed)
		Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]		
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate	Low
Applicant's Proposed Action	40.1	0.0	26.9	13.2	0.0	38.6	1.5	13.6	26.5	40.1
Variation S4-A1	*5.9*	*0.0*	*4.7*	*1.2*	*0.0*	*5.4*	*0.5*	*5.0*	*0.9*	*5.9*
Variation S4-A2	*6.0*	*0.0*	*3.6*	*2.4*	*0.0*	*5.3*	*0.7*	*5.3*	*0.7*	*6.0*
Variation S4-A3	*6.1*	*0.0*	*3.7*	*2.4*	*0.0*	*5.4*	*0.7*	*5.3*	*0.8*	*6.1*
Tub Mountain South	40.5	0.3	15.4	24.8	0.3	33.3	6.9	16.7	23.8	40.5
Willow Creek	34.6	0.0	19.1	15.5	0.0	29.1	5.5	14.1	20.5	34.6

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have only low residual impacts on soils. The variations for the Proposed Action would have the same residual impacts on soils

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have only low residual impacts on mineral resources. The variations of the Proposed Action would have the same residual impacts on mineral resources.

Table 3-47 presents the residual impacts on mineral resources for all alternative routes and route variations in Segment 4.

Table 3-47. Minerals Inventory Data and Residual Impacts on Segment 4—Brogan							
Alternative Route	Total Length (miles)	Inventory Data (miles crossed)			Residual Impacts (miles crossed)		
		Active Mine or Active Mining Claims (miles crossed)	All Leases (miles crossed)	Producing Oil and Gas or Geothermal Wells (miles crossed)	None	Low	Moderate
Applicant's Proposed Action	40.1	3.8	6.0	1.1	32.9	1.2	6.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*5.9*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*6.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*6.1*	*0.0*	*0.0*
Tub Mountain South	40.5	3.7	22.7	0	17.8	0.0	22.7
Willow Creek	34.6	2.7	4.6	1.1	30.0	0.0	4.6

Table Note: [1]Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

Paleontological Resources

Table 3-48 presents the residual impacts on paleontological resources for all alternative routes and route variations in Segment 4.

Table 3-48. Paleontological Resources Inventory Data and Residual Impacts on Segment 4—Brogan

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)					Residual Impacts (miles crossed)
		1	2	3	4	5	Low
Applicant's Proposed Action	40.1	8.6	14.7	5.8	11.0	0.0	40.1
Variation S4-A1	*5.9*	*0.0*	*2.7*	*2.7*	*0.5*	*0.0*	*5.9*
Variation S4-A2	*6.0*	*0.0*	*2.3*	*3.1*	*0.6*	*0.0*	*6.0*
Variation S4-A3	*6.1*	*0.0*	*2.2*	*3.3*	*0.6*	*0.0*	*6.1*
Tub Mountain South	40.5	0.0	10.0	3.1	27.4	0.0	40.5
Willow Creek	34.6	0.0	10.2	2.7	21.7	0.0	34.6

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Proposed Action would have only low residual impacts on paleontological resources. The variations of the Proposed Action would have the same residual impacts on paleontological resources.

Tub Mountain South Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Tub Mountain South Alternative would have 0.1 mile of high residual impacts from geologic hazards associated with Quaternary faults.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Tub Mountain South Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with more (0.4 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Tub Mountain South Alternative would have 22.7 miles of moderate residual impacts on mineral resources.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Tub Mountain South Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (0.4 more miles) low residual impacts.

Willow Creek Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Willow Creek Alternative would have 0.1 mile of high residual impacts from geologic hazards associated with Quaternary faults.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Willow Creek Alternative would have similar residual impacts on soils as the Applicant's Proposed Action Alternative but with less (5.5 less miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Willow Creek Alternative would have 4.6 miles of moderate residual impacts on mineral resources.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Willow Creek Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with less (5.5 less miles) low residual impacts.

Conclusion

The Project would cross Quaternary faults in Segment 4. The Applicant's Proposed Action would cross the most Quaternary faults. Thus, impacts on the B2H Project from geological hazards would not be likely to occur during the life of the Project. The Project would cross soils sensitive to erosion and compaction in Segment 4. The Tub Mountain South Alternative would have the highest impact on soils with moderate susceptibility to wind and water erosion and The Applicant's Proposed Action Alternative would have the least. The Applicant's Proposed Action Alternative would have the greatest impact on soils with a moderate susceptibility for compaction, and the Willow Creek Alternative would have the least. However, with implementation of the selective mitigation measures (refer to Section 3.2.1.4), residual impacts would be low for any route selected.

All alternatives in Segment 4 would cross mineral resources. The Applicant's Proposed Action Alternative would cross the highest number of active mines or active claims, and the Willow Creek Alternative would have the least. The Tub Mountain South Alternative would have the highest number of producing oil and gas, or geothermal wells, and the Applicant's Proposed Action Alternative and Willow Creek Alternative would have the least. The Tub Mountain Alternative would have the greatest impact on leases (22.7 miles) whereas the Willow Creek Alternative would have the least (4.6 miles).

All alternatives cross geological units with moderate and high sensitivity for paleontological resources. The Tub Mountain South Alternative would have the highest impact on these geological units (30.5

miles of moderate and high sensitivity), and the Applicant's Proposed Action Alternative would have the least (16.8 miles).

SEGMENT 5—MALHEUR

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-49 presents the residual impacts on geologic hazards for all alternative routes and route variations in Segment 5.

Table 3-49. Alternative Route Comparison for Geologic Hazards Inventory Data and Residual Impacts on Segment 5—Malheur

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]		Residual Impacts (miles crossed)		
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84	Low	Moderate	High
Applicant's Proposed Action	40.4	0.0	0.0	0.0	40.4	0.0	40.4	0.0	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*0.0*
Malheur S	43.5	0.1	0.0	0.0	43.5	0.0	43.5	0.0	0.0
Malheur A	43.1	0.1	0.0	0.0	43.1	0.0	43.1	0.0	0.0

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 5

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have only low residual impacts from geologic hazards. The variations to the Proposed Action would have the same residual impacts from geologic hazards.

Soils

Table 3-50 presents the residual impacts on soil resources for all alternative routes and route variations in Segment 5.

Table 3-50. Soils Inventory Data and Residual Impacts on Segment 5—Malheur

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)								Residual Impacts (miles crossed)
		Water Erosion Potential (K factor)			Wind Erosion Potential (WEG)			Soil Compaction Potential[1]		
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate	Low
Applicant's Proposed Action	40.4	0.0	27.1	13.3	0.0	39.6	0.8	15.2	25.2	40.4
Variation S5-A1	*7.4*	*0.0*	*6.4*	*1.0*	*0.0*	*7.4*	*0.0*	*2.4*	*5.0*	*7.4*
Variation S5-A2	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*	*7.4*	*0.0*	*2.6*	*4.8*	*7.4*
Variation S5-B1	*2.5*	*0.0*	*1.0*	*1.5*	*0.0*	*2.5*	*0.0*	*1.0*	*1.5*	*2.5*
Variation S5-B2	*2.8*	*0.0*	*1.5*	*1.3*	*0.0*	*2.8*	*0.0*	*2.2*	*0.6*	*2.8*
Malheur S	43.5	0.0	32.0	11.5	0.0	43.3	0.2	14.8	28.7	43.5
Malheur A	43.1	0.0	32.5	10.6	0.0	42.6	0.5	14.0	29.1	43.1

Table Notes:
[1]Soil compaction potential is based on clay content.
No high impacts are anticipated for soil resoures.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have only low residual impacts on soil resources. All variations of the Proposed Action would have the same residual impacts on soils.

Minerals

Table 3-51 presents the residual impacts on mineral resources for all alternative routes and route variations in Segment 5.

Table 3-51. Minerals Inventory Data and Residual Impacts on Segment 5—Malheur

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)[1]			Residual Impacts (miles crossed)		
		Active Mine or Active Mining Claims (miles crossed)	All Leases (miles crossed)	Producing Oil and Gas or Geothermal Wells (miles crossed)	None	Low	Moderate
Applicant's Proposed Action	40.4	0.3	16.5	2.0	23.4	0.5	16.5
Variation S5-A1	*7.4*	*0.0*	*4.3*	*0.0*	*3.1*	*0.0*	*4.3*
Variation S5-A2	*7.4*	*0.0*	*6.7*	*0.0*	*0.7*	*0.0*	*6.7*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*2.5*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*	*0.0*
Malheur S	43.5	3.9	12.1	2.0	27.2	4.2	12.1
Malheur A	43.1	6.0	12.1	2.0	24.7	6.3	12.1

Table Note: [1]Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have 16.5 miles of moderate residual impacts on mineral resources.

Variation S5-A1

This variation would have 4.3 miles of residual impacts on mineral resources.

Variation S5-A2

This variation would have 6.7 miles of residual impacts on mineral resources.

Variation S5-B1

This variation would have 0.0 mile of residual impacts on mineral resources.

Variation S5-B2

This variation would have 0.0 mile of residual impacts on mineral resources.

Paleontological Resources

Table 3-52 presents the residual impacts on paleontological resources for all alternative routes and route variations in Segment 5.

Table 3-52. Paleontological Resources Inventory Data and Residual Impacts on Segment 5—Malheur

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)					Residual Impacts (miles crossed)
		1	2	3	4	5	Low
Applicant's Proposed Action	40.4	1.0	13.5	0.0	25.9	0.0	40.4
Variation S5-A1	*7.4*	*0.0*	*1.3*	*0.0*	*6.1*	*0.0*	*7.4*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*	*7.4*
Variation S5-B1	*2.5*	*0.0*	*1.4*	*0.0*	*1.1*	*0.0*	*2.5*
Variation S5-B2	*2.8*	*0.0*	*1.4*	*0.0*	*1.4*	*0.0*	*2.8*
Malheur S	43.5	1.5	19.1	0.0	22.9	0.0	43.5
Malheur A	43.1	1.2	18.6	0.0	23.3	0.0	43.1

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Proposed Action would have only low residual impacts on paleontological resources. The variations would have the same residual impacts on paleontological resources as those of the Proposed Action.

Malheur S Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Malheur S Alternative would have the same residual impacts from geologic hazards as those of the Applicant's Proposed Action Alternative.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Malheur S Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with more (3.1 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Malheur S Alternative would have 12.1 miles of moderate residual impacts on mineral resources.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Malheur S Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (3.1 more miles) low residual impacts.

Malheur A Alternative

Geologic Hazards

Following implementation of the design features for environmental protection and selective mitigation measures, the Malheur A Alternative would have the same residual impacts from geologic hazards as those of the Applicant's Proposed Action Alternative.

Soils

Following implementation of the design features for environmental protection and selective mitigation measures, the Malheur A Alternative would have similar residual impacts on soils as those of the Applicant's Proposed Action Alternative but with more (2.7 more miles) low residual impacts.

Minerals

Following implementation of the design features for environmental protection and selective mitigation measures, the Malheur A Alternative would have 12.1 miles of moderate residual impacts on mineral resources.

Paleontological Resources

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Malheur A Alternative would have similar residual impacts on paleontological resources as those of the Applicant's Proposed Action Alternative but with more (2.7 more miles) low residual impacts.

Conclusion

For Segment 5, The Malheur S and A alternatives cross a Class B fault. No other geological hazards are crossed in Segment 5. Thus, impacts on the B2H Project from geological hazards would not be likely to occur during the life of the Project. All alternative routes considered cross soils with moderate potential for water and wind erosion and soil compaction. However, with implementation of the selective

mitigation measures (refer to Section 3.2.1.4), residual impacts would be low for any route selected. The Applicant's Proposed Action Alternative would have the highest impact on soils with moderate susceptibility to wind and water erosion. The Malheur A Alternative would have the least impact on soils with moderate susceptibility to water erosion, and the Malheur S Alternative would have the least for soils with moderate susceptibility to wind erosion. The Malheur A Alternative would have the greatest impact on soils with a moderate susceptibility for compaction, and the Applicant's Proposed Action Alternative would have the least.

All alternatives in Segment 5 cross mineral resources. The Malheur A Alternative would cross the most active mines and mining claims (6 miles), and the Applicant's Proposed Action Alternative would cross the least. The Applicant's Proposed Action Alternative would cross the largest area with leases (16.5 miles). All alternatives in Segment 5 have similar impacts to producing wells.

All alternatives for Segment 5 cross geological units with high sensitivity for paleontological resources in Segment 5. The Applicant's Proposed Action Alternative would have the highest impact on these geological units (25.9 miles), and the Malheur S Alternative would have the least (22.9 miles).

SEGMENT 6—TREASURE VALLEY

Applicant's Proposed Action Alternative

Geologic Hazards

Table 3-53 presents the residual impacts on geologic hazards for all alternative routes and route variations in Segment 6.

Table 3-53. Geologic Hazards Inventory Data and Residual Impacts on Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]		Residual Impacts (miles crossed)		
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84	Low	Moderate	High
Applicant's Proposed Action	28.0	1.4	0.0	0.0	28.0	0.0	28.0	0.0	0.0
Variation S6-A1	*9.3*	*0.8*	*0.0*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.2*	*0.0*	*0.0*	*8.9*	*0.0*	*8.9*	*0.0*	*0.0*

Table 3-53. Geologic Hazards Inventory Data and Residual Impacts on Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Faults (miles crossed)[1]			Landslide Hazard Percentile Ranking (miles crossed)[2]		Residual Impacts (miles crossed)		
		Quaternary Faults Older Than 15,000 Years and Class B Faults	Younger Than 150 years	Greater Than 150 Years, but Less Than 15,000 Years Old	0 to 69	70 to 84	Low	Moderate	High
Variation S6-B1	*14.4*	*0.6*	*0.0*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*0.0*
Variation S6-B2	*14.1*	*1.2*	*0.0*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*0.0*

Table Notes:
[1]Due to the overlap of faults occurring during several time periods, the total miles crossed will not equal the total length of the alternative routes and route variations.
[2]There were no areas with high landslide percentile for Segment 6

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have 1.4 miles of high residual impacts from geologic hazards associated with Quaternary faults.

Variation S6-A1

This variation would have 0.8 mile of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Variation S6-A2

This variation would have 0.2 mile of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Variation S6-B1

This variation would have 0.6 mile of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Variation S6-B2

This variation would have 1.2 miles of moderate residual impacts from geologic hazards associated with older Quaternary faults.

Soils

Table 3-54 presents the residual impacts on soil resources for all alternative routes and route variations in Segment 6.

Table 3-54. Soils Inventory Data and Residual Impacts on Segment 6—Treasure Valley										
Alternative Route	Total Length (miles)	Inventory Data (miles crossed)								Residual Impacts (miles crossed)
		Water Erosion			Wind Erosion			Clay		
		Unknown	Low	Moderate	Unknown	Low	Moderate	Low	Moderate	Low
Applicant's Proposed Action	28.0	0.4	25.5	2.1	0.4	27.0	0.6	25.9	2.1	28.0
Variation S5-A1	*9.3*	*0.3*	*8.2*	*0.8*	*0.3*	*8.9*	*0.1*	*7.9*	*1.4*	*9.3*
Variation S5-A2	*8.9*	*0.3*	*8.0*	*0.6*	*0.3*	*8.5*	*0.1*	*7.4*	*1.5*	*8.9*
Variation S5-B1	*14.4*	*0.1*	*13.3*	*1.0*	*0.1*	*14.0*	*0.3*	*14.4*	*0.0*	*14.4*
Variation S5-B2	*14.1*	*0.0*	*13.7*	*0.4*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*
Table Notes: [1]Soil compaction potential is based on clay content. No high impacts are anticipated for soil resoures.										

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have only low residual impacts on soils. The variations would have the same residual impacts on soils as those of the Proposed Action.

Minerals

Table 3-55 presents the residual impacts on mineral resources for all alternative routes and route variations in Segment 6.

Table 3-55. Minerals Inventory Data and Residual Impacts on Segment 6—Treasure Valley							
Alternative Route	Total Length (miles)	Inventory Data (miles crossed)			Residual Impacts (miles crossed)		
		Active Mine or Active Mining Claims (miles crossed)	All Leases (miles crossed)	Producing Oil and Gas or Geothermal Wells (miles crossed)	None	Low	Moderate
Applicant's Proposed Action	28.0	4.3	0.0	0.0	23.7	4.3	0.0
Variation S6-A1	*9.3*	*2.3*	*0.0*	*0.0*	*7.0*	*2.3*	*0.0*
Variation S6-A2	*8.9*	*1.9*	*0.0*	*0.0*	*7.0*	*1.9*	*0.0*
Variation S6-B1	*14.4*	*2.0*	*0.0*	*0.0*	*12.4*	*2.0*	*0.0*
Variation S6-B2	*14.1*	*1.7*	*0.0*	*0.0*	*12.4*	*1.7*	*0.0*
Table Note: [1]Due to some mineral resources not occurring for the alternative routes and route variations, the miles crossed will not equal the total length of the alternative routes and route variations.							

Following implementation of the design features for environmental protection and selective mitigation measures, the Proposed Action would have no moderate or high residual impacts on mineral resources. The variations for this Proposed Action would have the same residual impacts on mineral resources.

Paleontological Resources

Table 3-56 presents the residual impacts on paleontological resources for all alternative routes and route variations in Segment 6.

Table 3-56. Paleontological Resources Inventory Data and Residual Impacts on Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Potential Fossil Yield Classification (miles crossed)					Residual Impacts (miles crossed)
		1	2	3	4	5	Low
Applicant's Proposed Action	28.0	7.8	2.9	14.5	2.8	0.0	28.0
Variation S6-A1	*9.3*	*3.5*	*0.0*	*3.7*	*2.1*	*0.0*	*9.3*
Variation S6-A2	*8.9*	*2.2*	*0.0*	*4.7*	*2.0*	*0.0*	*8.9*
Variation S6-B1	*14.4*	*4.3*	*0.6*	*9.5*	*0.0*	*0.0*	*14.4*
Variation S6-B2	*14.1*	*5.5*	*0.4*	*8.2*	*0.0*	*0.0*	*14.1*

Following implementation of the design features (Section 2.3.4) for environmental protection and Selective Mitigation Measure 8, the Proposed Action would have only low residual impacts on paleontological resources. The variations for this Proposed Action would have the same residual impacts on paleontological resources.

Conclusions

The Applicant's Proposed Action Alternative as well as all variations, do cross Quaternary faults in Segment 6. The Applicant's Proposed Action Alternative would cross the most number of faults with Variation S6-A2 having the least. The Applicant's Proposed Action Alternative and all variations considered cross soils with moderate potential for water and wind erosion and soil compaction. However, with implementation of the selective mitigation measures (refer to Section 3.2.1.4), residual impacts would be low for any route selected.. The Applicant's Proposed Action Alternative would have the greatest impact on soils with moderate susceptibility to wind and water erosion, and compaction.

The Applicant's Proposed Action Alternative and all variations considered cross active mines and mining claims in Segment 6. The Applicant's Proposed Action Alternative would cross the highest amount of active mines and mining claims and Variation S6-B2 would have the least among the variations.

The Applicant's Proposed Action Alternative, and variations S6-A1 and S6-A2 cross geological units with high and moderate sensitivity for paleontological resources. Variations S6-B1 and S6-B2 only cross geological units with moderate sensitivity for paleontological resources.

3.2.2 WATER RESOURCES

3.2.2.1 INTRODUCTION

This section discusses water and floodplains, including surface water, groundwater, and wetlands. The regulatory framework, scoping issues, methods, and affected environment are presented, followed by a discussion of environmental impacts from the B2H Project.

- Wetland data was refined based on a GIS desktop analysis.
- Additional analysis was conducted on impacts on Riparian Conservation Areas (RCAs).
- In response to specific comments on the Draft EIS, references to subsections 2 through 5 of Executive Order 11990: Protection of Wetlands, have been added.
- A discussion of proposed impacts on the Ladd Marsh Wildlife Area has been added to the Segment 2 discussion, per comments received on the Draft EIS.
- Updated, revised design features and selective mitigation measures have been included for determining residual impact assessment.
- The impact criteria table has been revised and updated to include references to specific types of wetlands and streams, per comments on the Draft EIS.

3.2.2.2 REGULATORY FRAMEWORK

FEDERAL

Water Resources

Water resources and floodplains are federally regulated under the CWA (33 U.S.C. 1257 et seq.), the Safe Drinking Water Act (SDWA)(42 U.S.C. 300f et seq.), and Executive Order 11988 – Floodplain Management (3 CFR 121, Supp. 177) and Executive Order 11990 – Protection of Wetlands (3 CFR, 1977 Comp., p. 121).

Clean Water Act

The Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution. The Water Pollution Control Act was amended in 1977, and the law became commonly known as the CWA, codified generally in 33 U.S.C. 1251 et. seq. The CWA's objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.

The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point-source and certain nonpoint-source discharges to surface water.

Under authority of the federal CWA, both Idaho and Oregon have developed state water-quality standards. The IDEQ has issued water-quality standards that include a description of hydrologic units; a list of priority pollutants; and a list of water-quality-impaired streams within each subbasin, along with the parameters for which each stream is impaired (IAPA 58.0.02). The ODEQ maintains water-quality standards for groundwater and surface water for Oregon. Oregon standards include a classification system describing the highest beneficial uses, fish use designations, narrative and numeric criteria to support the beneficial uses, and antidegradation policies (OAR 340-01-0001). The BLM and USFS have

developed handbooks and instruction memoranda that provide BMPs to avoid erosion and the resulting contribution of sediments to water(s) of the U.S. (BLM 2008; USFS 2006, 2013).

The following sections of the CWA may influence construction and maintenance of the B2H Project:

Clean Water Act Section 301: Effluent Limitations from Point Sources

Section 301 of the CWA states that the volume of pollutants generated by a known source, or point source, is limited by the volume of the specific water resources, as described in Section 303(d). These limitations may affect the Project if a construction-related activity discharges a controlled pollutant, such as sediment, into regulated waters, which would require a permit.

Clean Water Act Section 302: Water Quality Related Effluent Limitations

Section 302 of the CWA designates water-quality standards by the state-set levels of allowable pollutants called Total Maximum Daily Load (TMDL). This pollutant allotment criterion is designated for a specific waterbody relative to its particular usage (e.g., recreation, water supply, aquatic life, and agriculture). A water-quality criterion (numeric pollutant concentrations and narrative requirements) also is designated to protect particular resource uses. If the Project has the potential to add pollutants to a particular resource that is protected by a TMDL, it may be necessary to mitigate impacts and potentially require the Project to be included in the TMDL permit.

Clean Water Act Section 303(d): Water Quality Limited Streams and Subbasins

Section 303(d) of the CWA requires states to establish TMDL programs for streams and lakes that do not meet certain water-quality standards. A TMDL is a quantitative assessment of water-quality problems, contributing sources, and load reductions or control actions needed to restore and protect bodies of water. In compliance with the CWA, the IDEQ and the ODEQ have identified Section 303(d) water-quality limited streams and lakes for development of TMDL criteria. The IDEQ (IAPA 58.01.02) and ODEQ (OAR 340-41) assess impaired streams on a subbasin level, which is the same level as a USGS eight-digit hydrologic unit code (HUC). In some subbasins, if a stream segment does not meet water-quality standards, all the streams within that hydrologic unit do not meet the standard.

Designation of impaired waters indicates which waterbodies do not meet state-mandated water-quality standards and are presented to the EPA for designation as impaired waters and issuance of federal protection under a TMDL. Impaired waters that potentially may be affected by the Project are subject to limitations set forth by the TMDL issued for the particular impaired water. If there is a high probability the Project will affect the impaired water, modification to the state Construction General Permit could be required.

Clean Water Act Section 311: Oil and Hazardous Substances Liability

Section 311 of the CWA provides the framework for determining whether an oil spill to inland and coastal waters or their adjoining shorelines, or both, should be reported to the federal government. If hazardous materials, including fuels and lubricants, are used or stored in quantities exceeding certain minimal quantities, a spill prevention, countermeasure, and containment (SPCC) plan is required. Section 311(j)(1)(c) of the CWA contains the regulations preventing discharge of oil to surface water.

In particular, the regulation requires the person in charge of a facility or vessel responsible for discharging oil that may be "harmful to the public health or welfare" to report the spill to the federal government. The regulation establishes the criteria for determining whether an oil spill may be harmful to public health or welfare, thereby triggering reporting requirements.

Clean Water Act Section 319: Effluent Limitations from Nonpoint Sources

Section 319 of the CWA was created following the 1987 amendments to the CWA for management of nonpoint-source pollution. Section 319 regulates the discharge of pollutants from various sources, which accumulate and reduce water-quality standards set by the state. If the Project has the potential to add nonpoint-source pollutants to a particular resource protected by a TMDL, it may be necessary to mitigate impacts and may potentially require the Project to be included into the TMDL permit.

Clean Water Act Section 401: Water Quality Certification

Section 401 of the CWA pertains to federally permitted activities that may result in a discharge into water of the U.S. Projects must obtain a water-quality certification from the state with jurisdiction, certifying that the action will not violate state or federal water-quality standards. Any activity, including river or stream crossings during road or transmission line construction that may result in a discharge into a water of the U.S., must be certified by the IDEQ or ODEQ. State requirements are discussed further below.

Clean Water Act Section 402: National Pollutant Discharge Elimination System

Section 402 pertains to point-source discharges to water resources, which are regulated by the NPDES permit process. Section 402 applies to discharges from all lands, regardless of ownership. The EPA administers the NPDES permit process in Idaho, whereas the ODEQ is delegated to administer the NPDES process in Oregon.

NPDES regulates water-quality standards specifically by issuing and monitoring construction-related permits for discharges into water(s) of the U.S. (described in more detail in the "State of Oregon" and "State of Idaho" sections).

Under NPDES, projects that disturb one or more acres are required to obtain a Construction General Permit. This permit, in turn, requires the development and implementation of a SWPPP. The Applicant has proposed a framework SWPPP as a part of its POD. The SWPPP describes BMPs that the discharger will use to protect surface water from stormwater runoff.

Clean Water Action Section 404: Discharge of Dredge and Fill Materials

Section 404 of the CWA pertains to dredge or fill activities in a water of the U.S., as defined in 33 CFR Part 328.3 of the CWA. The USACE and the EPA regulate the discharge of dredge and fill material into "Waters of the United States" under Section 404(a) of the CWA. Waters of the U.S. are defined as:

> All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide, all interstate waters including interstate wetlands, all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats,

> sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which would affect interstate or foreign commerce, including such waters which are or could be used by interstate or foreign travelers for recreational or other purposes, or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce, or which are used or could be used for industrial purposes by industries in interstate commerce; all impoundment of waters otherwise defined as waters of the United States interstate commerce, tributaries of waters, the territorial seas; and wetlands adjacent to waters. (33 CFR 328.3)

The term "wetlands adjacent to waters (of the United States)" includes wetlands that are adjacent to traditionally navigable waters or non-navigable tributaries of traditionally navigable waters that are relatively permanent, (i.e., where the tributaries typically flow year-round or have continuous flow at least seasonally and wetlands that directly about such tributaries). The USACE determines whether a given wetland is under federal jurisdiction through project-specific jurisdictional determinations.

The permitting process includes submittal of a permit application. Following the receipt of all required information, the USACE would determine whether the Project qualifies for consideration under the Nationwide Permits or instead would merit review as a standard individual permit. A public notice is issued for projects that do not qualify for Nationwide Permit authorization with a 30-day public comment period. During the public comment period, the USACE consults with other agencies, as needed, and may require a public hearing. The final decision is made on a case-by-case basis through the evaluation of the purpose and need of the proposed Project and the expected short- and long-term impacts of the work, and with consideration given to the comments of other government agencies, adjacent property owners, and the general public.

While contacting the local USACE office prior to making a permit application is encouraged, it is not required; however, by discussing the work prior to submitting an application, the application likely would be processed more efficiently. Discussions of permit applications may consist of on-site reviews or pre application meetings. These meetings discuss possible problems up-front and attempt to rectify initial concerns prior to the permit review.

When all considerations are satisfied, the district engineer would decide to either issue or deny the permit. If the permit is denied, the Applicant will receive a written explanation for the reason of denial. The USACE makes every effort possible to process individual permit applications within 120 days of the date of the submission of a complete application. Often, reviews conducted by other agencies may exceed USACE time lines.

Executive Order 11988: Floodplain Management

Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. To accomplish this objective, Section 1 of the executive order provides the following direction:

> Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands, and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Section 2(a) of the executive order describes the decision-making process required of federal agencies when evaluating projects that have potential impacts on floodplains.

The National Flood Insurance Program is administered by FEMA, a component of the U.S. Department of Homeland Security. In support of the National Flood Insurance Program, FEMA identifies flood hazard areas throughout the U.S., including Special Flood Hazard Areas, which are defined as areas of land that would be inundated by a flood having a 1 percent chance of occurring in any given year (previously referred to as the base flood or 100-year flood). Development may take place in Special Flood Hazard Areas, provided development complies with local floodplain management ordinances, which must meet the minimum federal requirements. Not all jurisdictions along the alternative routes have been mapped for flood zones under the National Flood Insurance Program.

Executive Order 11990: Protection of Wetlands

Executive Order 11990 was signed May 24, 1977, and requires each federal agency to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Each agency, to the extent permitted by law, must avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds that there is no practical alternative to such construction or the Proposed Action includes all practical measures to minimize harm to wetlands that may result from such use. In making this finding, the head of the agency may take into account economic, environmental, and other pertinent factors (Section 2(a)). Each agency also must provide the opportunity for early public review of any plans or proposals for new construction in wetlands (Section 2(b)).

Food Security Act of 1985

The Swampbuster Provision of the Food Security Act of 1985 requires private landowners who are receiving USDA program benefits to comply with federal CWA wetland requirements.

Wallowa-Whitman National Forest Land and Resource Management Plan

The Wallowa-Whitman National Forest is in the process of updating its LRMPs and will incorporate the B2H Project as part of the baseline condition for analysis as the LRMP process moves forward. The current Wallowa-Whitman National Forest LRMP requires that wetlands be identified and that negative impacts on wetlands be avoided, if possible, or mitigated (USFS 1990). The revised LRMP and Draft EIS for Malheur, Umatilla, and Wallowa-Whitman National Forests was published and made available for public comment on March 14, 2014 (USFS 2013). This revised LRMP includes management areas for streams, ponds, and wetlands. Although specific widths are provided for these features, the intention

is to include the greater of either the outer extent of riparian vegetation or the 100-year floodplain. This revised LRMP includes, for wetlands greater than 1 acre, a management area of 150 feet slope distance from the outer edge of the wetland or from the maximum pool elevation, whichever is greatest. The management area for wetlands smaller than 1 acre is 100 feet slope distance. A detailed discussion regarding assessment and analysis of riparian areas is provided in more detail in Section 3.2.2.4.

Drinking Water Resources

Safe Drinking Water Act

The Safe Drinking Water Act originally was passed by Congress in 1974 to protect public health by regulating the quality of drinking water. The act, which was amended in 1986 and 1996 (ODEQ 1996), is the primary federal law to protect the quality of U.S. drinking water and its sources—that is, rivers, lakes, reservoirs, springs, and groundwater wells (42 U.S.C. 300f et seq. (1974)).

Under the act, the EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers that implement those standards. However, the act does not regulate private wells serving fewer than 25 people. The Safe Drinking Water Act also mandates that a Groundwater Wellhead Protection Program be developed by each state to protect groundwater resources that serve as sources for public drinking water.

Wellhead Protection Programs

The Safe Drinking Water Act requires states to develop wellhead protection programs and to identify wellhead protection areas for each drinking water well. Wellhead protection areas are defined in 42 U.S.C. 300h-7(3) as the “surface and subsurface area surrounding a water well or well field supplying a public water system through which contaminants are reasonably likely to move toward and reach such water well or well field.”

Source Water Assessment Plans

In 1996, Congress amended the Safe Drinking Water Act to emphasize the protection of surface water and groundwater sources used for public drinking water. The amendments require that each state possessing primacy over its drinking water (1) develop a source water assessment plan for public drinking water sources and (2) conduct assessments on all public water systems and make the assessments available to the public.

The Idaho Source Water Assessment Plan was completed in 1999, at which time it also was approved and recognized by the EPA (State of Idaho 2016). The IDEQ completed assessments on recognized public water sources, serving as a foundation for public water systems to prepare drinking water protection plans and implement protection measures.

Oregon is in the process of developing its program by expanding the older Wellhead Protection Program and adding surface-water sources (ODEQ 1996). The wellhead protection areas became known as drinking water source areas and include groundwater and surface-water sources.

Floodplains

The National Flood Insurance Program (NFIP) (FEMA 2015a) created in 1968 is administered by FEMA, a component of the U.S. Department of Homeland Security. In support of the NFIP, The NFIP sets a national standard for regulating new development in floodplains, distributes responsibility for floodplain management at the local level, and provides for a comprehensive floodplain mapping program.

Development may take place in mapped Special Flood Hazard Areas, provided development complies with local floodplain management ordinances, which must meet the minimum federal requirements. Not all jurisdictions along the B2H Project alternative routes have been officially mapped by FEMA for flood zones under the NFIP.

STATE OF OREGON

Water Resources

The ODEQ provides local regulation of the CWA under ORS 4648B.005 (10). The ODEQ oversees water quality for water(s) of the U.S. in Oregon, implements water-quality policies, and acts to protect and maintains and improves water quality under several sections of the CWA. The ODEQ reviews projects that require issuance of Section 401 water-quality certifications

Wetlands

The Oregon Department of State Lands (ODSL), under the Aquatic Resource Management Division, is responsible for administering the state's removal-fill law.

The ODSL regulates the removal and placement of material in waterways and wetlands through Oregon's Removal-Fill Law of 1967. Removal includes the extraction or movement of substrate material from a wetland or stream. Fill includes the placement of organic or inorganic material into a wetland or stream. A threshold of 50 cubic yards of material requires that a permit be obtained for most activities. Waters in Oregon designated either as essential salmon habitat, state scenic waterways, or wetland mitigation areas (including impacts on associated upland buffers) require a removal-fill permit regardless of the size of impact. Temporary fill, including fill required for temporary roads or stockpiling, must be included in all fill calculations and contributes to the fill threshold needed for a removal-fill permit. Fill within federally recognized tribal lands typically is not subject to the requirements of the ODSL. Artificially created ponds and wetlands are regulated under the jurisdiction of the ODSL (1) if they are more than 1 acre in size or were created in an area that originally was a water of the U.S. or (2) for authorized wetland mitigation. Wetlands and ponds less than an acre in size and that were created from upland sites are exempt if their intended purpose is for wastewater or stormwater treatment and storage, settling ponds, agricultural ponds, fire ponds, cooling water, surface mining, log storage, or ornamental ponds. Ditches are regulated if (1) they are created in a wetland, if they convey flows of a naturally occurring stream, and if they have a "free and open" connection to a waterway, or (2) if they support populations of fish. If roadside ditches, irrigation channels or other linear depressions do not include the aforementioned characteristics, they are not regulated by Oregon.

To comply with State Planning Goal No. 5, the ODSL must ensure that issuance of a removal-fill permit is not inconsistent with the "protection, conservation, and best uses of the water resources of the State" (OAR 141-085-0565). The rule states that project impacts on water resources should be the minimum necessary, and that the project will not unreasonably interfere with the navigation, fishery, or public recreation of state-owned submerged waters. The following are nine additional factors the ODSL considers prior to issuing a permit:

- The public need for the proposed fill or removal and social, economic, or other public benefits likely to result from the proposed fill or removal;
- The economic cost to the public if the proposed fill or removal is not accomplished;
- The availability of alternatives to the project for which the fill or removal is proposed;
- The availability of alternative sites for the proposed fill or removal;
- Whether the Applicant for the proposed fill or removal conforms with sound policies of conservation and the fill or removal would not interfere with public health and safety;
- Whether the proposed fill or removal conforms with existing public uses of waters and uses designated for adjacent land in an acknowledged comprehensive plan and land-use regulations;
- Whether the proposed fill or removal is compatible with the acknowledged comprehensive plan and land-use regulations for the area where the proposed fill or removal is to take place or can be conditioned on a future local approval to meet this criterion;
- Whether the proposed fill or removal is for streambank protection; and
- Whether the Applicant has provided all practical mitigation to reduce the adverse effects of the proposed fill or removal. If off-site compensatory wetland mitigation is proposed, the Applicant must document the impracticality of on-site compensatory wetland mitigation (OAR 141-085-0565).

The ODSL also reviews wetland delineations and reports, which must include specific methodology and formatting to be accepted; the ODSL has 120 days to review the wetland delineation reports following submittal of the report and required fees. On report and delineation approval, the ODSL issues a jurisdictional determination that is valid for 5 years.

The Applicant anticipates that the ODSL Removal-Fill Permit requirements will be addressed through the EFSC site-certificate process and not through an independent permit-application process.

Ground Water Act

When pumping of groundwater exceeds the long-term natural replenishment of the source aquifer, the Ground Water Act of 1955 (ORS 537.505 et seq.) gives the Oregon Water Resources Department (OWRD) the authority to declare the aquifer a critical groundwater area and, therefore, to restrict water use. In groundwater-limited areas, the OWRD restricts future uses of groundwater.

Floodplains

The Oregon Department of Land Conservation and Development (OLDCD) serves as the state´s coordinating agency for the NFIP through an agreement with the FEMA. The OLDCD's participation in

the NFIP addresses the requirements of statewide planning Goal 7 with respect to flood hazards. Development within Oregon floodplains generally is not prohibited. Floodplain management entails implementation of mitigation measures that may include specific actions that can be taken to prevent future damages and threats to human life. Floodplain management generally is permitted at the local level (city, county, or tribe) using the 2012 Oregon Model Companion Flood Damage Prevention Ordinance (State of Oregon 2011).

Oregon Energy Facility Siting Council

Oregon's EFSC was created in 1975. The council has regulatory and siting responsibility for many high-voltage transmission lines. A proposed facility must undergo a thorough review process and must meet the council's siting standards to receive a site certificate. The EFSC consults with other state agencies by requesting the agencies' comments and proposed site-certificate conditions. The site certificate authorizes the developer to construct and operate the facility.

The Applicant intends that the EFSC site-certificate process will be used to fulfill all state-level requirements for B2H Project-permitting actions.

STATE OF IDAHO

Water Resources

The Idaho Department of Water Resources (IDWR) and the IDL regulate jurisdictional water(s) of the U.S. in Idaho under the Idaho Stream Channel Protection Act of 1971 (Title 42, Chapter 38, Idaho Code, 1993) and the Lake Protection Act (Section 58, Chapter 13 et seq., Idaho Code, 2008). The Idaho Stream Channel Protection Act requires that stream channels and their environment be protected against alteration for the protection of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, and water quality. The USACE and Idaho (through the IDWR and IDL) have established a joint review and approval process for activities affecting jurisdictional waterways.

Stream Channel Protection Act

The Idaho Stream Channel Protection Act requires that an applicant secure a stream-channel alteration permit from the IDWR before beginning any work that will alter the stream channel. Idaho Stream Channel Alteration Rule 37.03.07 defines stream channel as "a natural water course of perceptible extent with definite beds and banks which confines and conducts continuously flowing water." A stream-channel alteration is defined as any activity that obstructs, diminishes, destroys, alters, modifies, relocates, or changes the natural existing shape or direction of water flow of any stream channel (IDAPA 37.03.07.010.01). This definition includes taking material out of the channel or placing material or structures in or across the channel where the potential exists to affect flow in the channel. Idaho Stream Channel Alteration Rule 37.03.07 defines stream channel as a natural water course of perceptible extent with definite beds and banks which confines and conducts continuously flowing water.

Wetlands

The IDWR and IDL review applications for wetland permits in concert with the USACE for potential impacts on wetland resources. As stated above, the USACE and Idaho (through the IDWR and IDL) have established a joint review and approval process for activities affecting jurisdictional wetlands.

Groundwater Management Areas

In Idaho, the director of the IDWR can designate critical groundwater areas and groundwater management areas (IDAPA 58.01.11). A critical groundwater area is defined as an area that does not have sufficient groundwater to provide a reasonably safe supply for irrigation or other uses at the current or projected rates of withdrawal. No critical groundwater areas have been mapped in the study corridor in Idaho. The nearest groundwater management area is Grand View-Bureau, located east of the B2H Project area in Owyhee County, Idaho.

Floodplains

The governor of Idaho signed state Executive Order 2015-06 on June 22, 2015, to designate the IDWR as the lead state agency to lead and implement the National Flood Insurance Act of 1968. The IDWR floodplain manager coordinates the NFIP in Idaho. Management involves reviewing city ordinances created to deal with floodplain problems and assisting communities in adopting floodplain ordinances and qualifying for the NFIP, which makes it possible for citizens to qualify for FEMA flood insurance. Issuance of floodplain authorizations occurs at the local level in Idaho.

3.2.2.3 Issues Identified for Analysis

The following points summarize water resource-related issues that were raised by the public, federal, and state agencies or Native American tribal governments during scoping or issues that must be considered as stipulated by law or regulation:

- Would ground-disturbing activities affect surface waters, including water quality, quantity, and hydrologic behavior of surface waters?
- Would construction, operations, and maintenance of the B2H Project affect groundwater levels, contamination, or ability to recharge (especially as it relates to potential blasting)?
- Could the B2H Project affect drinking water?
- Could the loss of riparian vegetation affect stream temperature?
- Would national or Oregon scenic waterways be affected?
- Are there wetlands in the B2H Project area?
- Would there be any negative impacts on wetlands?
- What will the B2H Project's effects be on water quality?
- Does the Applicant need to acquire water rights for the B2H Project? If so, from where?
- Will post construction stormwater runoff have impacts?

3.2.2.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 2.5.1 and 3.1.3. This section discusses how the study methods are applied to assess the impacts of the B2H Project on water resources.

DATA SOURCES

Information for the water-resources inventory was obtained from review of scientific literature; from governmental agencies; and from expert institutions, including the BLM, USFS, NRCS, USDA, NRCS, EPA, USFWS, FEMA, USGS, OWRD, Oregon Biodiversity Information Center (ORBIC), ODSL, ODEQ, IDWR, and IDEQ and other state-associated agencies.

U.S. Geological Survey Hydrologic Unit Code (HUC) and the Watershed Boundary

Water resources occurring in the B2H Project study corridor are spatially referenced by the Watershed Boundary Database (WBD) and HUC. The WBD is maintained by the USGS and can be accessed through the USDA NRCS Geospatial Data Gateway (USGS 2015a, 2015b).

A hydrologic unit is a drainage area delineated to nest in a multilevel, hierarchical drainage system. Its boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream, or similar surface waters. A hydrologic unit can accept surface water directly from upstream drainage areas and indirectly from associated surface areas, such as remnant, noncontributing, and diversions, to form a drainage area with single or multiple outlet points. Hydrologic units are only synonymous with classic watersheds when their boundaries include all the source area contributing surface water to a single defined outlet point (USGS 2016a).

The WBD is similar to the original HUC system developed by the USGS and establishes a baseline drainage boundary framework, accounting for all land and surface areas determined solely on science-based hydrologic principles. The WBD differs from the original system by differentiating surface-water drainage areas into six distinct levels rather than four. These six levels include regions (2-digit HUC), subregions (4-digit HUC), basins (6-digit HUC), subbasins (8-digit HUC), watersheds (10-digit HUC), and subwatersheds (12-digit HUC).

During consultation with land managers (i.e., the BLM and USACE) (R. Pastor, personal communication with author, August 2015), representatives from the cooperating agencies indicated their preference to work with the standard fourth-level 8-digit HUC system. The standard 8-digit HUC is used broadly and is applicable to the B2H Project. Subbasins found in the study corridor have vastly different attributes, including mean annual precipitation, drainage area, elevation ranges, and relative aspect (cardinal direction in which the watershed is oriented), all of which play a pivotal role in determining which ecological community or communities are supported in any given drainage area. The distribution of watershed boundaries across the B2H Project area is displayed on MV-6.

Surface Waters

Streams and Waterbodies

The USGS National Hydrography Dataset (NHD) was used to evaluate the number of surface waterbodies that may be crossed by the B2H Project and alternatives. The NHD is a combination of USGS hydrologic digital line graph (DLG) files and EPA stream-reach files, version 3.0 (RF3) (USGS 2013).The surface waterbodies that would be crossed include streams, lakes, ponds, reservoirs, artificial drainage paths, and human-made canals or ditches.

In the B2H Project area, the NHD classifies natural streams as perennial or intermittent (including ephemeral). Perennial streams contain water throughout the year except during periods of drought. Intermittent streams contain water for extended periods but only at certain times of the year, such as when a stream receives seasonal flow from springs or melting snow. Ephemeral streams are very small and generally flow only during large rainfall events. The NHD also includes human-made canal ditches and other artificial paths.

The NHD represents the best available data regarding stream location and type for the entire B2H Project area. The accuracy of the NHD stream data, both for geographic placement and stream type, is primarily based on photographic interpretation and some limited field survey conducted during the Draft EIS (Idaho Power Company 2012).

NHD streams data are limited in terms of specific geometry errors with respect to stream centerlines; changes in stream geometry since initial mapping, as streams may have moved by natural processes; omission of stream segments and headwater areas during initial mapping; and errors in classification of stream type (intermittent vs. perennial). The limited field surveys conducted prior to the Draft EIS for this B2H Project noted that some NHD-mapped streams do not exist on the ground. Revisions to the dataset included incorporating field-checked corrections for attribute verification and location accuracy that have been made where possible.

Data sources also include the OWRD and the IDWR to supplement USGS NHD data. To quantify the number of streams by periodicity (i.e., perennial, intermittent, or artificial ditch) crossed by the Proposed Action and all alternatives, counts of each stream by type were made for both the 1,000-foot buffer and within each subbasin. The 1,000-foot buffer is being used in response to comments on the Draft EIS. A total count of streams that are either directly crossed by the B2H Project alternative route centerlines or that cross buffer areas was completed and compared to all streams mapped within each HUC 8 subbasin. A percentage of affected resources will be calculated for stream type by subbasin and buffer area. The distribution of streams by periodicity across the B2H Project area is displayed on MV-6.

303(d) Listed Impaired Waterbodies

CWA 303(d) listed impaired waterbodies were obtained from data available from EPA Region 10's geospatial gateway, and the IDEQ's and ODEQ's websites (EPA 2016a; IDEQ 2014; ODEQ 2012). Because increases in sediment delivery and stream temperature are the most likely B2H Project impacts on water quality, the analysis evaluated stream segments identified on the 303(d) list as already impaired due to either sedimentation (sediment-impaired streams) or high temperatures

(temperature-impaired streams). Several sediment and temperature TMDLs have been established for surface waters in Oregon and Idaho.

Several waterbodies within the B2H Project area have been identified by the States of Oregon and Idaho, respectively, and designated as impaired waters by the EPA. These water resources may exceed federal water-quality standards for temperature or sediment and may harbor noxious aquatic plants, show signs of significant riparian habitat alteration, low-dissolved oxygen, increased water temperature, or a suite of these problematic elements. Impairment originates from many sources, including agricultural activities, urban runoff, development of impervious surfaces, and recreational activities (ODEQ 2012).

Understanding from where pollutants originate is a developing science in the field of water-quality management. Known sources were initially identified as point-source pollutants as these types of pollutants can be traced to a known source. State and federal water-quality control agencies, including the Oregon Department of Environmental Quality, the Idaho Department of Environmental Quality and the EPA, have identified sources of pollutants and established limits to effluence using TMDLs to identify agency approved maximum-allowable discharge. NPDES has been integral in the establishment of TMDLs and identification of point-source pollutants in the B2H Project area. These actions have significantly improved water quality in Oregon, Idaho and the U.S. (U.S. General Accounting Office 1999).

Until recently, nonpoint-source pollution has been subject to relatively little regulatory attention by the states and EPA. Management of nonpoint-source pollution for the B2H Project relies on the use of design features, which are based off of a number of voluntary environmental protection incentive programs administered by the EPA (U.S. General Accounting Office 1999). Determining the source of a particular type of nonpoint pollution (e.g., sedimentation, discharge of nutrients, or pathogen-harboring effluent) is highly problematic. The States of Oregon and Idaho, respectively, are responsible for collecting and disclosing data from statistical modeling and physical investigation of potential sources of nonpoint-source pollutants used in developing the state list of impaired waters.

When the states recognize potentially impaired waters, modeling and analysis data are sent to the EPA for review and validation. The EPA will often issue a recommended TMDL for the impaired water. Both Oregon and Idaho's State 303(d) list of impaired waters identifies problematic surface-water resources and their TMDL (if an EPA-issued recommended TMDL has been issued) as well as the type and source of impairment.

To quantify the number of temperature- and sediment-impaired waterbodies crossed by the Proposed Action and all alternatives, data for TMDL listed streams and respective state-listed streams for either temperature or sediment impairment were combined into a single geospatial data file. Counts of each stream by impairment type (temperature or sediment) were made for each HUC subbasin within a 1,000-foot buffer from the B2H Project centerlines. The 1,000-foot buffer is being used in response to comments on the Draft EIS.

A total count of 303(d) listed streams for temperature or sediment impairment that either directly crosses the B2H Project alternative route centerlines or cross the 1,000-foot buffer area will be made and compared to all 303(d) listed impaired streams mapped within each HUC 8 subbasin. A percentage of affected resources will be calculated for stream type by subbasin. The distribution of streams by impairment type across the B2H Project area is displayed on MV-6.

Surface-Water Diversions

Geospatial data for Idaho and Oregon (IDWR 2015; OWRD 2013) was reviewed to evaluate surface-water diversions within 1 mile of the alternative route centerlines. A total count of all surface-water diversions, per HUC 8 subbasin was conducted. These sources have not been field verified. Surface diversions were calculated by combining geospatial data from the IDWR, Oregon Data Explorer, OWRD, and USDA NRCS. The combined diversion dataset was overlain on the 1-mile buffer for the alternatives and counts of diversions within each subbasin were calculated.

Surface Water Drinking Water Sources Areas

The ODEQ website was searched to identify locations of surface water drinking water source areas (DWSA) in Oregon (ODEQ 2014). Surface DWSAs represent the watershed that supplies the waterbody where the intake is located (ODEQ 2013). These features are not mapped in Idaho. The ODEQ data was overlaid with the study corridor boundary and the HUC 8 subbasin boundary data to determine total acreage of DWSAs within each boundary. The acreage of surface-water DWSAs within the HUC 8 subbasin boundary was calculated and is presented as a percentage of the total HUC 8 subbasin area in Table 3-64.

Wetlands

Revised wetland data was used in this Final EIS, per receipt of both public and agency comments regarding data sources for wetlands analysis. The Draft EIS used the USGS ReGap land-use classification data for vegetation type (Idaho Power Company 2011), which is built on color infrared imagery captured between 1999 and 2001 (Homer at al. 2012). The ReGap data is represented as 30-meter by 30-meter pixels. The 30 by 30 meter pixels represent a conservative estimate of wetland types and provide an overestimation of wetlands throughout the study corridor. This dataset was replaced with a more refined, accurate dataset developed through a GIS desktop analysis for wetlands within 0.5 mile of B2H Project alternative routes.

The GIS desktop analysis consisted of developing a composite dataset and visually reviewing features from the composite dataset for accuracy against aerial imagery. The composite dataset was created using sources from the National Wetlands Inventory (NWI) (USFWS 2015) supplemented by wetlands and land-type data from the Oregon Wetlands Cover (OWC) (ORBIC and The Wetlands Conservancy [TWC] 2009), a key component of the Oregon Wetland Explorer data portal. The Oregon Wetland Explorer is a comprehensive database whose sources include: the Natural Resources Inventory (NRI), the Oregon Department of Transportation (ODOT), the ODSL, the Oregon Natural Heritage Information Center (ORNHIC), the Pacific Northwest Hydrography Framework (PNHF), potential wetlands, The Nature Conservancy (TNC), TWC, the USFWS, and the USACE.

The composite wetland dataset compiled for this Final EIS is more accurate than the USGS ReGap data, however, there are several known errors in mapping in the original NWI source data (Gergely and McKerrow 2013; Grossmann et al. 2008). These errors include errors in accuracy of wetland boundaries primarily based on photographic interpretation and field checking by government agencies at the time the maps were compiled or revised; changes in wetland boundaries since initial mapping, as wetlands may have moved by natural processes; and known issues with unmapped drier-end wetlands, mowed and grazed wetlands, and significantly drained wetlands. Forested wetlands, small wetlands (less than 0.5 acre), and narrow (linear) wetlands tend to be the major sources of omissions in the original mapping. NWI maps, by design, do not show many farmed wetlands, which may lead to a significant underestimate of the amount of wetland in agricultural regions.

The composite wetlands data was overlaid on 1-meter color aerial imagery from the USDA Farm Service Agency National Aerial Imagery Program photography. The imagery was dated between 2011 and 2015 for both Oregon and Idaho (USDA 2015), NRCS hydric soil mapping units, as identified by the USDA NRCS Soil Survey for each county crossed by the B2H Project centerline, also was overlain on the imagery (USDA 2013). Features from the composite wetland dataset were reviewed visually for accuracy against the aerial imagery and hydric soils data and were revised to eliminate wetlands that have been shown on the imagery as currently developed. Wetland polygons located over soil mapping units identified as hydric were examined to correct interpretive boundaries (i.e., edges of lakes and ponds were corrected against aerial photography).

Wetlands in the B2H Project area were classified as emergent, scrub-shrub, forested or open water wetland types based on the Cowardin code (Cowardin et al. 1979). A fifth category of “unknown” was used to classify wetland areas observed through the visual review process that exhibited a high probability of being a wetland habitat, however the wetland type was unable to be determined. For example, an aerial image of dark green vegetation within an agricultural field overlaid on areas of 100 percent hydric soils in a small, local depression, exhibits a high likelihood of being a wetland. Unknown wetlands are presented only for a qualitative assessment of areas of potential resource and are not carried forward for quantitative impact assessment. The revised composite wetlands data was subdivided by HUC 8 subbasin boundaries to determine acres of wetlands within each subbasin. The distribution of wetlands by community type across the B2H Project area is displayed on MV-6.

Groundwater

Inconsistencies in geologic materials create difficulties for estimating areas of shallow groundwater, drinking water recharge zones and depth to groundwater (Ponce 2006). Shallow groundwater systems interact with surface water, while deep groundwater systems do not (Ponce 2006). Part of the difficulty of describing groundwater within a region, including how geologic units (bedrock) are described differently by different drillers, is that each driller has a unique style of data recording and interpretation. Since water well databases in Oregon generally are historic or archival, the Oregon digital database was created from paper records. An additional source of error in water well databases results from the manual entry of hard copy information into electronic format.

Due to the inconsistencies in mapping of groundwater resources throughout the B2H Project area, effects on groundwater resources are discussed qualitatively.

Shallow Groundwater

Estimates of depth-to-water and water-table elevation are affected by a number of variables, including soil type and porosity, local geologic characteristics, timing of precipitation, and errors associated with the mapping and reporting of data, as well as effects due to the interpolation method (USGS 2015b). The actual water-table depth will vary as a result of short-term, seasonal, or long-term influences, including seasonal rainfall, localized flooding or volume, and intensity of snowmelt.

The OWRD maintains several state-monitored wells that measure depth to groundwater within the study corridor along the I-84 corridor (OWRD 2016). Active wells with current depth to groundwater readings were reviewed to determine whether groundwater was registered within 6.5 feet of the surface.

Groundwater well data from the USGS National Water Information System (USGS 2016b) for Boise, Idaho (the closest monitoring station to the study corridor), shows that groundwater depths vary from approximately 5 feet below ground level to more than 25 feet below ground level. The reporting station is located on the northeastern edge of the Boise River Floodplain.

The USDA NRCS Web Soil Survey uses a predictive model for estimating depth to groundwater, based on soil taxonomy (USDA 2016a). Depth to groundwater is based on soil unit types classified as either shallow (soil mapping units with predicted depth to groundwater within 6.5 feet of the surface) and deep (soil mapping units with predicted depth to groundwater deeper than 6.5 feet below the surface). This information was qualitatively compared with the USGS National Water Information System to measure predictability of results.

Groundwater Drinking Water Source Areas

The ODEQ website was searched to identify locations of groundwater DWSA and groundwater 2-year time-of-travel zones for drinking water source areas in Oregon (ODEQ 2013). These features are not mapped in Idaho.

Oregon's Source Water Assessments were completed between 2000 and 2005 (ODEQ 2013). The DWSA delineations by the ODEQ define areas that supply the drinking water system. For groundwater, this is defined as the area on the surface that overlies that portion of the aquifer that supplies water to a well or spring (ODEQ 2013). DWSAs for wells typically show the amount of time it takes groundwater to move through the aquifer to the well intake. For this EIS, the 2-year time-of-travel zone for groundwater was used to incorporate short- and longer-term impacts on groundwater resources.

To identify the groundwater DWSAs potentially affected by the B2H Project, the study corridor was overlaid with the ODEQ groundwater DWSA data indicating mapped drinking water sources. The acreage of groundwater DWSAs within both the 1-mile study corridor and each HUC 8 subbasin crossed by the centerline of the alternatives was determined, and the percentage of the affected area was calculated.

Water Wells

IDWR and OWRD databases were used to identify water wells within the 1-mile buffer study corridor (IDWR 2012; OWRD 2016). The combined data include permitted wells; water-level monitoring wells, and shallow and deep injection wells. A distinction between well types has not been made to simplify the results. The density of wells mapped by IDWR is much greater than the density mapped by OWRD.

The number of water wells was determined by HUC 8 subbasin. To compare the number of wells between the Proposed Action and the alternatives, the numbers of wells within the 1-mile study corridor were counted by alternative and compared to the number of total wells within each HUC 8 subbasin crossed by the centerline of the alternatives.

Designated Sole-Source Aquifers

The EPA defines a sole or principal-source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer (EPA 2016b). EPA guidelines also stipulate that these areas can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend on the aquifer for drinking water. For convenience, all designated sole or principal-source aquifers are usually referred to simply as "sole-source aquifers." Sole-source aquifer designation provides only limited federal protection of groundwater resources that serve as drinking water supplies. The EPA states that sole-source aquifers are not a comprehensive groundwater protection program. Although designated aquifers have been determined to be the "sole or principal" source of drinking water for an area, this does not imply that they are more or less valuable or vulnerable to contamination than other aquifers that have not been designated by the EPA.

The EPA Region 10 website was searched to identify locations of mapped designated sole-source aquifers in the water resources study corridor (EPA 2013a). The sole-source aquifer that is closest to the water resources study corridor is the Lewiston Basin Aquifer (in southeastern Washington and western Idaho) and the Eastern Snake River Plain Aquifer (along the Snake River in south-central and southeastern Idaho). No sole-source aquifers or sole-source recharge zones are mapped in the study corridor.

Floodplains

FEMA data and the OPS *National Disaster Study, National Pipeline Risk Index Technical Report* (1996) were used to evaluate the flood hazard rankings for the water resources study corridor (FEMA 2015b; OPS 1996). The OPS data provide flood hazard rankings for the U.S., including those portions of Oregon and Idaho near the B2H Project. Flooding risk (based on FEMA mapping) was used to produce flood hazard rankings from 0 to 100, where 0 represents the lowest flood hazard and 100 represent the highest. Flood hazard rankings of 85 to 100 represent a high risk from flooding, rankings of 70 to 84 represent a medium risk, and rankings less than 70 represent a low risk.

Evaluation of the B2H Project is discussed under Section 3.2.1.4 for potential hazard effects due to flooding on B2H Project facilities, both upstream and downstream of proposed crossing areas.

Riparian Conservation Areas

RCAs were used to define and analyze impacts on wetlands and riparian resources. RCAs encompass traditional riparian corridors, wetlands, intermittent streams, waterbodies, as well as upland areas that maintain the integrity of aquatic ecosystems by: (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams; (2) providing root strength for channel stability; (3) shading streams; and (4) protecting water quality. In addition, riparian-associated plants and animals rely on these areas for critical life functions (e.g., reproduction) and to provide connectivity and dispersal corridors. RCAs are considered portions of watersheds where riparian dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines (USFS and BLM 1995), and are consistent with the Decision Notices for Pacific Anadromous Fish Strategy (PACFISH) and Inland Native Fish (INFISH), the Updated Interior Columbia Basin Strategy, and the proposed federal agency RMPs covering lands within the study corridor. A detailed discussion of RCAs is included in Section 3.2.2.4.

ANALYSIS AREA

To provide a consistent area of analysis and compare the potential effects of all alternative routes considered for the B2H Project, the water resources study corridor included all water resources located within a 1-mile corridor; 0.5 mile on either side of the alternatives centerlines, regardless of the land ownership or jurisdiction. The 1-mile study corridor was chosen because it is large enough to encapsulate existing water resources in the vicinity of the B2H Project area, as well as the extent of potential direct and indirect impacts on water resources that could occur during construction and operations of the B2H Project.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

The criteria used to assess impacts were developed in collaboration with the cooperating agencies to assess the intensity of potential effects on water resources from construction, operation, and maintenance of the B2H Project; these criteria also allow equivalent comparison among alternative routes (Table 3-57). Criteria focused on the abundance of a particular resource, the potential for damage to or long-term loss of water and wetland resources, federal and state statutes applicable to water and wetland resources, and the varying degrees of importance that different water resources have to the greater ecosystem. Impact criteria were determined with consideration of the nature and magnitude of expected impacts on sensitive water resources, anticipated length of time needed to recover from disturbance, and federal and state laws protecting resources.

Table 3-57. Criteria for Assessing Intensity of Impacts on Water Resources	
Intensity of Impacts	**Description**
High	• B2H Project activities that result in impacts on wetland functions that last more than 3 years • B2H Project activities that negatively affect forested wetlands, including removal of trees or alteration of tree heights • B2H Project activities that permanently affect natural springs or existing water wells • Placement of tower foundations in areas of shallow groundwater, surface and groundwater drinking water source areas or sole-source aquifers • B2H Project activities that result in long-term increase (greater than 3 years) of sedimentation to nearby surface-water resources
Moderate	• B2H Project activities that result in short-term (fewer than 24 months in duration) increases in sedimentation or temperature increases to nearby surface-water resources, including 303(d) impaired waters • Permanent fill within 100 year floodplain limits
Low	• Temporary dredge/fill (fewer than 24 months) in water(s) of the U.S. • Temporary fill (lasting fewer than 24 months) within the 100 year floodplain limits

Effects Analysis

Assessment of Initial Impacts

Initial impacts are those effects resulting from the implementation of the B2H Project, with consideration of the design features of the B2H Project for environmental protection. These design features would be implemented throughout the B2H Project where appropriate and are expected to reduce initial impacts on water resources. Initial impacts on water resources were assigned using the criteria for assessing impacts identified in Table 3-57. A list and description of all design features of the B2H Project for environmental protection is provided in (Table 2-7). Design features relevant to water resources are summarized below:

- **Design Feature 1 (Plan of Development)**. A POD would be prepared for implementation and maintenance of the B2H Project to provide direction to (1) the Applicant's construction personnel, construction contractors and crews, CIC, environmental monitors, and agency personnel regarding specification of construction and (2) provide direction to the agencies and Applicant's personnel for operation and maintenance of the B2H Project. The POD would contain implementation plans and detailed mapping to facilitate execution of design features to minimize impacts on water resources, mitigation measures, and conservation measures. Example implementation plans specific to water resources include a Water Resources Protection Plan; Environmental Compliance Management Plan; Biological Resources Conservation Plan; and Reclamation, Revegetation, and Monitoring Plan Framework.
- **Design Feature 2 (Environmental Training for All Personnel)**. Prior to construction, the CIC would instruct all personnel on the protection of ecological and natural resources, such as (1) federal and state laws regarding special status plants, including collection and removal; (2) the importance of special status plants; (3) the purpose and necessity of protecting special status plants; and (4) reporting and procedures for stop work. This design feature would minimize

effects on water resources and the vegetative communities providing shade and water filtering capabilities.

- **Design Feature 5 (Spatial Extent of Construction Activities)**. The spatial limits of construction activities, including vehicle movement, would be predetermined with activity restricted to and confined within those limits. No paint or permanent discoloring agents indicating survey or construction limits would be applied to rocks, vegetation, structures, fences, etc. This design feature would minimize effects on water resources by restricting disturbance to a predefined extent.
- **Design Feature 6 (Reclaim Construction Areas)**. In construction areas (e.g., staging areas, material laydown yards, fly yards, and wire pulling/splicing sites) where there is ground disturbance and where recontouring is required, surface reclamation would occur as required by the Reclamation, Revegetation, and Monitoring Plan or the landowner. The method of reclamation may consist of, but is not limited to, returning disturbed areas to their natural contour, reseeding, installing cross drains for erosion control, placing water bars in permanent roads, and filling ditches where they were installed for temporary roads. As a part of the construction or maintenance, or both, of the proposed transmission line, all areas disturbed would be seeded with a seed mixture appropriate for those areas as identified in the Reclamation, Revegetation, and Monitoring Plan. The federal land-managing agency or landowner(s) would approve a seed mixture that is compatible with the affected Ecological Site Description. Seeding methods typically would include drill seeding, where practicable; however, the federal land-managing agency or landowner(s) may recommend broadcast seeding as an alternative method in some cases.

  In construction areas where disturbing the existing contours is not required, vegetation would be left in place wherever possible, and original contours would be maintained to avoid excessive root damage and allow for resprouting, in accordance with the Reclamation, Revegetation, and Monitoring Plan or landowner approval. This design feature would minimize effects on vegetation resources by preventing permanent loss of vegetation communities and reducing indirect effects associated with weed invasion and degradation of special status plant habitat.
- **Design Feature 9 (Use of Access Routes Outside the Right-of-way)**. All vehicle movement outside the right-of-way would be restricted to predesignated access, contractor-acquired access, public roads, overland travel routes, or crossing of streams approved in advance by the applicable land-managing agency or landowner. This would minimize effects on water resources by minimizing disturbance and reducing the potential of non-native plant establishment.
- **Design Feature 14 (Shallow Groundwater Discovery during Drilling)**. State standards for abandoning drill holes would be adhered to where groundwater is encountered.
- **Design Feature 15 (Reduce Impacts on Riparian Areas)**. Consistent with the BLM and USFS PACFISH/INFISH riparian management policies, surface-disturbing activities would be avoided in defined segments of RCAs, using the following delineation criteria, unless exception criteria defined by the BLM are met or with agency approval of acceptable measures to protect riparian

resources and habitats by avoiding or minimizing stormwater runoff, sedimentation, and disturbance of riparian vegetation, habitats, and wildlife species:

- Fish-bearing streams: 300 feet slope distance on either side of the stream, or to the extent of additional delineation criteria—whichever is greatest.
- Perennial non-fish-bearing streams: 150 feet slope distance on either side of the stream, or to the extent of additional delineation criteria—whichever is greatest.
- Ponds, lakes, reservoirs, and wetlands greater than 1 acre: 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs; from the edge of the wetland, pond or lake; or to the extent of additional delineation criteria—whichever is greatest.
- Intermittent or seasonally flowing streams and wetlands greater than 1 acre: In watersheds that support ESA-listed fish species or designated critical habitat, or both, 100 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever resource has the greater areal extent. In watersheds that do not have current documented presence of ESA-listed fish species or designated critical habitat, 50 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever resource has the greater areal extent.

Mitigation measures, such as micro-siting road locations, would be developed on a site-specific basis, in consultation and coordination with the BLM and other federal land-managing agencies, and incorporated into the POD. This would minimize effects on water resources by minimizing disturbance to streams, wetlands, and riparian areas.

- **Design Feature 16 (Span Riparian Communities/Water Courses)**. Based on biological resources surveys and results of Section 7 consultation, state and federally designated sensitive plants, fisheries, wetlands, riparian areas, springs, wells, water courses, or rare/slow regenerating vegetation communities would be flagged and structures would be placed to allow spanning of these features, where feasible, within the limits of standard structure design. This would minimize effects on water resources by siting B2H Project facilities outside of these areas.
- **Design Feature 17 (Work during Wet Periods)**. If work were required during wet periods with saturated soil conditions, vehicles would not be allowed to travel when soils are moist enough for deep rutting (4 or more inches deep) to occur unless prefabricated equipment pads (matting) were installed over the saturated areas or other measures were implemented to prevent rutting. Equipment with low-ground-pressure tires, wide tracks, or balloon tires would be used when possible. This would minimize effects on water resources by reducing soil disturbance or alterations to hydrologic regimes.
- **Design Feature 18 (Crossing of Dry Washes)**. Crossings of dry washes would be made during dry conditions, when possible. Repeated crossings would be limited to the extent possible and constrained to the same location with appropriate stabilization to reduce erosion potential.

- **Design Feature 19 (Canal or Ditch Crossings, or both)**. Canal or ditch crossings, or both, would require placement of temporary bridges or improvement of existing crossings.
- **Design Feature 20 (Reduce Potential for Aquatic Invasive Species)**. Interagency-developed methods of avoidance, inspection, and sanitization as described in the Operational Guidelines for Aquatic Invasive Species Prevention and Equipment Cleaning (USFS 2009) would be adhered to. If control of fugitive dust near sensitive waterbodies is necessary, water would be obtained from treated municipal sources or drafted from sources known to contain no aquatic invasive species. Support vehicles, drill rigs, water trucks, and drafting equipment would be inspected and sanitized, as needed, following interagency-approved operational guidelines. This design feature would minimize effects on water resources by reducing the potential for spread of aquatic invasive species.

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection, selective mitigation measures would be applied where feasible to reduce potential impacts on water resources or where required to comply with law, regulation, or agency policy. Once an alternative route is selected, the Applicant would coordinate with the BLM and other land-managing agencies or landowners, as appropriate, to refine the implementation of mitigation at specific locations. A list and descriptions of all selective mitigation measures are provided in Table 2-13. The selective mitigation measures that would be applied to water resources are summarized below:

- **Selective Mitigation Measure 2 (Use Existing Access or Crossing, or both, for Sensitive Resources Avoidance)**. Existing access or crossing, or both, would be used as much as possible/practicable for the construction and maintenance of the B2H Project to avoid disturbance of sensitive resources crossed by the B2H Project. Where applied, this measure is expected to reduce impacts on wetland and riparian communities by limiting disturbance associated with new access roads.
- **Selective Mitigation Measure 5 (Minimize Vegetation Clearing for Operational Clearances)**. Removal of vegetation in the right-of-way would be minimized to limit disturbance to timber resources and slow-growing vegetation communities and to protect sensitive resources, including wetlands. Trees and other vegetation would be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate. Where applied, this measure is expected to reduce impacts on slow-growing vegetation communities (forested wetland areas) by limiting clearing and disturbance to slow-growing vegetation.

Residual Impacts

Residual impacts are the impacts on resources anticipated to occur from B2H Project activities after the application of selective mitigation measures described in the Mitigation Planning and Effectiveness section. The application of selective mitigation measures is anticipated to reduce, from the initial levels, the level of residual impacts associated with B2H Project construction and maintenance (Table 3-58).

The level of anticipated residual impacts on water resources was assessed using the criteria presented in Table 3-57.

Table 3-58. Summary of Initial Impacts and Residual Impact Levels for Water Resources

Resource	Design Features of the B2H Project for Environmental Protection	Initial Impact	Selective Mitigation Measure	Residual Impact
Wetlands – forested	1, 2, 5, 6, 9, 15, 16, 17	High	2, 5	Moderate
Wetlands – scrub-shrub	1, 2, 5, 6, 9, 15, 16, 17	Moderate	2, 5	Low
Wetlands – emergent	1, 2, 5, 6, 9, 15, 16, 17	Low	None	Low
Wetlands – open water	1, 2, 5, 6, 9, 15, 16, 17, 20	Low	None	Low
Streams – perennial	1, 5, 6, 9, 16, 18, 19, 20	Moderate	2	Low
Streams – intermittent	1, 5, 6, 9, 15, 18, 19, 20	Low	None	Low
Streams – ephemeral	1, 5, 6, 9, 16, 18, 19, 20	Low	None	Low
303(d) listed/impaired waters (temperature)	1, 2, 5, 6, 9, 16, 18	Moderate	2	Low
303(d) listed/impaired waters (sediment)	1, 2, 5, 6, 9, 16, 18	Moderate	2	Low

Compensatory Wetland Mitigation

Compensatory wetland mitigation involves actions taken to offset unavoidable adverse impacts on wetlands, streams, and other aquatic resources regulated by the CWA Section 404 permitting process and other USACE permits. There are three mechanisms for providing compensatory mitigation: permittee-responsible compensatory mitigation, mitigation banks, and in-lieu-fee mitigation (USACE 2008). Compensatory mitigation could be satisfied by the creation, enhancement, or restoration of wetlands to replace the lost wetland acreage and functional capacity of the habitat that is initially affected. Other potential options include purchasing credits from a mitigation bank or in-lieu-fee programs. The type of compensatory mitigation required would be determined by the agencies as part of the Section 404 and ODSL removal-fill permitting processes.

As part of the Section 404 permitting process, the USACE, ODSL, and IDWR would evaluate whether wetlands have been avoided to the extent practical and whether the effects have been mitigated adequately. The permitting process also identifies additional requirements, as needed, to comply with USACE and ODSL regulations.

Permittee-responsible mitigation can be located at or adjacent to the impact site (i.e., on-site compensatory mitigation) or at another location generally within the same watershed as the impact site (i.e., off-site compensatory mitigation). Mitigation banks and in-lieu-fee mitigation involves off-site compensation activities generally conducted by a third party—a mitigation bank sponsor or an in-lieu-fee program sponsor. When a permittee's compensatory mitigation requirements are satisfied by a mitigation bank or in-lieu-fee program, the responsibility for ensuring that required compensation is successfully completed shifts from the permittee to the bank or in-lieu-fee sponsor.

According to the 2008 final rule on compensatory mitigation for losses of aquatic resources (USACE 2008), "compensatory mitigation should be located within the same watershed as the impact site, and should be located where it is most likely to successfully replace lost functions and services, taking into account such watershed-scale features as aquatic habitat diversity, habitat connectivity, relationships to hydrologic sources (including the availability of water rights), trends in land use, ecological benefits, and compatibility with adjacent land uses." The compensatory wetland mitigation final rule also prioritizes the sequencing of compensatory mitigation from highest priority (most favorable) to lowest priority (least favorable) as follows:

- Mitigation bank credits
- In-lieu-fee program credits
- Permittee-responsible mitigation under a watershed approach
- Permittee-responsible mitigation through on-site and in-kind mitigation
- Permittee-responsible mitigation through off-site and out-of-kind mitigation

Once a proposed route is determined and final engineering is completed, preconstruction surveys to confirm wetland boundaries and wetland types will be completed. Consultation with the USACE will occur to determine areas of impact and the appropriate wetland-permitting-vehicle required. Compensatory wetland mitigation also will be discussed and the most appropriate method to satisfy requirements for compensatory wetland mitigation will be determined. If mitigation bank or in-lieu-fee programs are unavailable for the B2H Project, the Applicant would be responsible for the development and implementation of any necessary mitigation.

The extent of compensatory wetland mitigation is determined through an evaluation of wetland class, acreage, and the functions and values provided by affected wetlands. The degree of functionality of each wetland would be evaluated using the Oregon Wetland Rapid Assessment Protocol (ORWAP) required by the ODSL in Oregon. This assessment method would be used for long-term wetland impacts greater than 0.2 acre; for wetland impacts less than this threshold, best professional judgment may be used for assessing wetland functional values. ORWAP also will be used to characterize the theoretical compensatory wetland mitigation site by predicting site characteristics to obtain expected functional values. The functional values of the affected site would be compared to those of the compensatory wetland mitigation site to determine whether adequate compensation is proposed.

In addition to meeting functional-value requirements, the ODSL currently requires the following mitigation ratios be adhered to:

- 1 acre of restored wetland for 1 acre of impact (1:1)
- 1.5 acres of created wetland for 1 acre of impact (1.5:1)
- 2 acres of enhanced cropped wetland for 1 acre of impact (2:1)
- 3 acres of enhanced wetland for 1 acre of impact (3:1)

Wetland mitigation requirements for greater than 0.2 acre of wetland impact require the following principal objectives be met:

- The replacement of wetland functions and values will be demonstrated using the ORWAP to assess the impact and mitigation sites.
- Locally important wetland functions will be replaced on or near-site where appropriate. The linear nature of the B2H Project may necessitate multiple mitigation sites.
- Compensatory wetland mitigation will be implemented in a manner that creates an eventually self-sustaining system.
- The compensatory wetland mitigation site will be in a logical biological setting chosen by considering a variety of aspects, such as its connectivity to protected habitats, the quality of adjacent upland buffers, long-term maintenance needs, the site's ability to mitigate for impact-site functions, and its compatibility with adjacent land uses.
- The temporal loss of wetlands will be considered and minimized when planning the timing of the wetland impact and mitigation time frame. This issue is especially relevant for forested wetland mitigation due to the time required to develop a forested vegetation class.

Compensatory wetland mitigation typically will occur through in-kind mitigation by replacing the affected wetland with the same type of wetland, although allowances may be made for logical mitigation sites that address the needs of the watershed in which the affected wetland is located. The ODSL also requires that compensatory wetland mitigation be implemented during the same construction season as the wetlands that are affected. A phased approach may be used for the B2H Project impacts that may occur over more than 1 year, and an increase in mitigation ratios also may be used to compensate for a delay in compensatory wetland mitigation. Existing wetland sites proposed for compensatory wetland mitigation must be degraded significantly, including sites that have had significant hydrological alterations, such as diking, ditching, drain tiling, or through fill. Wetland sites that do not qualify as degraded include those that have been altered solely through reversible activities, such as wetlands that have a high percentage aerial cover of non-native or invasive species, wetlands that are currently affected by grazing activities, and logging operations.

The ODSL provides additional guidelines for linear projects, such as transmission lines. Since these projects often result in small amounts of wetland impact over large areas, individual mitigation sites are often unfeasible. Compensatory wetland mitigation required acreage may be combined, resulting in mitigation of the predominant affected wetland type and combining all impacts occurring in the HUC 8 subbasin.

The Applicant will develop a Water Resources Protection Plan as part of the POD, which will include measures to ensure that adequate compensation is provided for wetland impacts.

Additional Analysis

In addition to the assessment of residual impacts on water resources, anticipated amounts of disturbance to water resources were analyzed using the best available B2H Project description. Prior to final engineering design, the location of B2H Project features, such as new access roads, upgrades to existing roads, drive-and-crush areas, transmission line structures, or other B2H Project facilities, were not available and are not identified in the B2H Project description. The disturbance analysis was

completed by estimating the total disturbance due to construction of features such as the B2H Project access network (construction of new roads, upgrades to existing roads, and drive-and-crush travel), transmission line structures, and other B2H Project facilities over the entire length of an alternative route. The analysis assumes a constant rate of disturbance per mile of transmission line, which was calculated using the estimated total disturbance and the total length of the transmission line. The rate then was used to estimate the extent of disturbance that is anticipated to occur with the length of each water resource crossed by an alternative route.

This information guided qualitative discussions assessing B2H Project impacts on wetlands and water resources using the criteria presented in Table 3-57.

3.2.2.5 AFFECTED ENVIRONMENT

REGIONAL SETTING

Alternative routes for the B2H Project span 2 states, 4 ecoregions, and 11 subbasins (EPA 2013b). Water resources throughout the B2H Project area reflect the diversity of the landscape in their location, distribution, scale, type, abundance, and condition.

This section describes the existing condition of water resources in the vicinity of the B2H Project. Water resources issues considered in this section include streams, surface-water quality, groundwater, wetlands, and floodplains. In addition, information about surface-water diversions, DWSA (surface and ground) and water wells in the vicinity of the B2H Project has been included.

Surface Water

Streams

Rivers, streams, and other water sources vary greatly throughout the B2H Project area, mainly due to variations in terrain, aspect, geology, and precipitation specific to the drainage areas from which they originate. Most of the significant waters found in the study corridor have conventional names (e.g., Grande Ronde River, Umatilla River, and McKay Creek), but the majority of intermittent and ephemeral streams do not. Rather than relying solely on conventional names, waters can be identified using two highly interconnected datasets, the WBD HUC and the NHD. As discussed previously, the HUC identifies where a water resource exists spatially in a drainage area, while the NHD comprises digital vector data features, such as lakes, ponds, streams, rivers, canals, dams, and stream gauges.

The alternative routes were overlain on the WBD HUC 8 boundaries and a GIS analysis identified 11 subbasins that were intersected by B2H Project centerlines or B2H Project analysis buffers, specific to each water resource under analysis for this EIS. Table 3-59 lists the subbasins in the study corridor:

Table 3-59. Hydrologic Unit Code 8 Subbasins Occurring within the Study Corridor

HUC 8 Code	Subbasin Name	Total Subbasin Acres	State
17050201	Brownlee Reservoir	833,878	Idaho, Oregon
17050118	Bully	375,014	Oregon
17050202	Burnt	703,634	Oregon
17050117	Lower Malheur	607,033	Oregon

Table 3-59. Hydrologic Unit Code 8 Subbasins Occurring within the Study Corridor			
HUC 8 Code	**Subbasin Name**	**Total Subbasin Acres**	**State**
17050110	Lower Owyhee	1,264,289	Oregon
17070101	Middle Columbia-Lake Wallula	1,641,881	Oregon, Washington
17050103	Middle Snake-Succor	1,498,734	Idaho, Oregon
17050203	Powder	1,093,024	Oregon
17070103	Umatilla	1,616,448	Oregon
17060104	Upper Grande Ronde	1,047,238	Oregon
1705019	Willow	486,196	Oregon
Table Source: USGS 2016a			

In addition to the perennial streams (streams that flow year-round) and rivers in the study corridor, the corridor also contains a number of ephemeral streams (streams that only flow during large rainfall events) and intermittent streams (streams that only flow for part of the year). These rivers and streams drain to several major watersheds that ultimately drain to the Columbia River. From northwest to southeast, the affected watersheds are the Middle Columbia and Lower Snake subbasins in Oregon and the Middle Snake subbasin in Oregon and Idaho.

Table 3-60 presents information on the number of perennial and intermittent streams mapped within each subbasin crossed by B2H Project alternative route centerlines.

Table 3-60. Number of Perennial and Intermittent Streams Crossed within 1,000 feet of Alternative Route Centerlines in Each Subbasin			
County	**Subbasin**	**Perennial**	**Intermittent**
Adams, Baker, Malheur, Wallowa, Washington	Brownlee Reservoir	34	72
Malheur	Bully	18	66
Baker, Grant	Burnt	505	604
Malheur	Lower Malheur	50	188
Malheur	Lower Owyhee	46	122
Morrow, Umatilla	Middle Columbia-Lake Wallula	1	54
Ada, Canyon, Owyhee, Malheur	Middle Snake-Succor	27	269
Baker, Union	Powder	315	608
Umatilla, Morrow	Umatilla	180	1095
Union	Upper Grande Ronde	185	406
Malheur	Willow	28	233
	Total	1,388	3,717

303(d) Listed Waterbodies

State-listed impaired waters (303(d) listed impaired waters) crossed by the B2H Project were identified during the water resources inventory. As authorized by the EPA under the CWA, the NPDES controls water pollution by regulating point sources that discharge pollutants into water(s) of the U.S. Point sources are discrete discharge areas, such as pipes, that can be traced back to the original source.

Since its introduction in 1972, the NPDES is responsible for significant improvements to U.S. water quality (EPA 2012).

Table 3-61 presents the number of stream segments in the study corridor identified on the 303(d) list for impaired water quality due to high levels of sediment or elevated temperature. Sheep Creek, Owyhee River, Cottonwood Creek, and Grande Ronde River are some of the impaired major streams crossed by the B2H Project.

Table 3-61. Total Number of 303(d) Listed Stream Segments in the Study Corridor

County	Subbasin	Sediment Impaired	Temperature Impaired
Adams, Baker, Malheur, Wallowa, Washington	Brownlee Reservoir	–	–
Malheur	Bully	–	–
Baker, Grant	Burnt	–	89
Malheur	Lower Malheur	–	–
Malheur	Lower Owyhee	–	3
Morrow, Umatilla	Middle Columbia-Lake Wallula	–	–
Ada, Canyon, Owyhee, Malheur	Middle Snake-Succor	59	–
Baker, Union	Powder	–	16
Umatilla, Morrow	Umatilla	36	18
Union	Upper Grande Ronde	6	14
Malheur	Willow	–	–
	Total	100	140

Surface Water Diversions

Within the study corridor 2,976 surface-water diversions were identified (Table 3-62). Most of these diversions are mapped within the Burnt River subbasin, between Baker and Grant counties. Surface-water diversions are used for irrigation and livestock watering. Some may be potable water sources, and others are used to support aquatic life and wildlife or to provide water for fire protection, road construction, or groundwater recharge. For assessment purposes, a distinction of use for surface-water diversions was not made.

Due to the preliminary nature of the alternative routes, a detailed analysis of effects on surface-water diversions within each analyzed route and variation is unable to be conducted at this time. Several design features, including Design Feature 5 (Spatial Extent of Construction Activities) and Design Feature 9 (Use of Access Routes Outside the Right-of-Way), along with micro-siting of towers, lay down yards, tensioning sites, and other B2H Project facilities, would be used to minimize, to the extent practicable, impacts on surface-water diversions. Preconstruction surveys for sensitive resources, including streams, canals, ditches and attendant features, such as surface-water diversions, would be conducted during implementation of the POD. Further analysis of surface-water diversions is not carried forward.

For each subbasin, Table 3-62 provides the total number of surface-water diversions in the study corridor.

Table 3-62. Total Number of Surface Water Diversions by Subbasin in the Study Corridor		
County	**Subbasin**	**Number of Mapped Diversion**
Adams, Baker, Malheur, Wallowa, Washington	Brownlee Reservoir	27
Malheur	Bully	8
Baker, Grant	Burnt	672
Malheur	Lower Malheur	28
Malheur	Lower Owyhee	42
Morrow, Umatilla	Middle Columbia-Lake Wallula	194
Ada, Canyon, Owyhee, Malheur	Middle Snake-Succor	170
Baker, Union	Powder	391
Umatilla, Morrow	Umatilla	981
Union	Upper Grande Ronde	399
Malheur	Willow	64
	Total	2976

Wetlands

There is a high level of variety in the composition, distribution, and abundance of wetlands areas across the B2H Project area; and water resources hydrologically connected to wetland areas are affected indirectly by the condition of those vegetation components. Wetlands function similarly in their capacity to maintain or even improve water quality by filtering waterborne sediments and cycling nutrients into the soil. The fibrous root systems and perennial nature of most wetland communities provide soil-stabilizing structure to the upper soil strata, reducing the likelihood that high flows and heavy rain events would wash away topsoil. Wetland areas serve as vectors for the percolation of surface water into groundwater systems (groundwater recharge), a process responsible for maintaining stable inputs into groundwater aquifers.

Wetlands also provide a high level of biotic nutrient exchange through the provision of detritus and large wood debris that promote productive, living, breathing soils. Abiotic processes also are commonplace in the vegetation and groundcover associated with wetland areas. Highly dense scrub/shrub and forested wetlands attenuate flood flows, thus reducing the erosive potential of high-velocity runoff events. Canopy cover comprising mature scrub/shrub, forested wetlands, an associated shade to water resources, maintaining—and in some cases improving—the quality and quantity of water through temperature control. It is because of these functions and values, provided by intact, undisturbed wetlands that wetlands are described by community type and are analyzed on the basis that loss or modification of these vegetation communities would have indirect, adverse effects on water quality.

Wetland types are classified by the dominant vegetation type and vegetation structure as defined by the Cowardin system (Cowardin et al. 1979). This system classifies wetland habitats by vegetation structure, density, and water regime. The Cowardin system is the method adopted for discussion of this resource. These wetland types are further defined below. Table 3-63 includes the acres of wetlands, by vegetation community type and HUC 8 subbasin area and county, in the study corridor.

Table 3-63. Acres of Wetlands by Type by Subbasin in the Study Corridor							
County	**Subbasin**	**Emergent Wetlands**	**Scrub-Shrub Wetlands**	**Forested Wetlands**	**Open Water**	**Unknown**	**Total**
Adams, Baker, Malheur, Wallowa, Washington	Brownlee Reservoir	44	8	10	210	82	354
Malheur	Bully	10	–	–	72	1	83
Baker, Grant	Burnt	1,001	430	466	960	1,198	4,055
Malheur	Lower Malheur	186	4	–	324	19	533
Malheur	Lower Owyhee	100	96	16	295	20	527
Morrow, Umatilla	Middle Columbia-Lake Wallula	116	–	22	79	150	367
Ada, Canyon, Owyhee, Malheur	Middle Snake – Succor	124	9	13	146	17	310
Baker, Union	Powder	5,019	68	41	916	312	6,356
Umatilla, Morrow	Umatilla	848	150	128	806	329	2,261
Union	Upper Grande Ronde	8	80	339	347	201	975
Malheur	Willow	8	3	85	232	25.6	427
	Total	7,537	848	1,120	4,387	2,354	16,248

Emergent Wetlands

Emergent wetlands (“palustrine emergent” in the 1979 Cowardin system) are dominated by erect rooted herbaceous hydrophytic angiosperms and have less than 30 percent cover of trees or shrubs. This wetland type is variable and can occur over a variety of locales, including arid-climate ephemeral depressions, farmed wetlands in agricultural areas, and wet meadows. Vegetation also is variable based on the locale but includes species adapted to prolonged inundation or soil saturation. Vegetation found in emergent wetlands includes grasses, sedges, rushes, and other forbs adapted to wet conditions. Common species in emergent wetlands may include reed canarygrass (*Phalaris arundinacea*), Baltic rush (*Juncus balticus*), bulrush (*Scirpus acutus*), and cattail (*Typha latifolia*).

7,537 acres of emergent wetlands are present in the study corridor; emergent wetlands are the most common wetland type and make up 46 percent of the wetland acreage. The Powder River subbasin has the greatest amount of emergent wetlands (5,019 acres) in the study corridor, while the Upper Grande Ronde has the lowest (8 acres).

Scrub-Shrub Wetlands

Scrub-shrub wetlands (“palustrine scrub-shrub” in the 1979 Cowardin system) are identified by the dominance of woody vegetation less than 20 feet tall that may include shrubs and sapling trees. A scrub-shrub dominated wetland has at least 30 percent cover of shrubs as the tallest vegetation layer. This wetland type also can occur over wide elevation ranges. Scrub-shrub wetlands in the water resources study corridor often include red-osier dogwood (*Cornus alba*), hawthorn (*Crataegus* spp.), Woods' rose (*Rosa woodsii*), golden currant (*Ribes aureum*), Douglas’ spiraea (*Spiraea douglasii*), and willow (*Salix* spp.).

Scrub-shrub wetlands are the least-common wetland type in the study corridor, totaling 848.8 acres. The majority of scrub-shrub wetlands are located in the Burnt River subbasin (430 acres).

Forested Wetlands

Forested wetlands ("palustrine forested" in the 1979 Cowardin system) are identified by the dominance of woody vegetation that is more than 20 feet tall with greater than 30 percent cover. Common species found in forested wetlands in the study corridor may include black cottonwood (*Populus trichocarpa*), quaking aspen (*Populus tremuloides*), Engelmann spruce (*Picea engelmannii*), and species of willow. There are 1,120.6 acres of forested wetlands are present in the study corridor. The Burnt River subbasin (466 acres) and the Upper Grande Ronde subbasin (339 acres) contain a majority of the forested wetlands in the study corridor.

Open Water

This community type is characterized by the presence of nearly permanent open water that is a minimum of 0.5 acre in size. Although free of vegetation throughout the non-growing season, floating vascular plants or algae, or both, often make up a majority of the vegetation mass during the midsummer months. Rooted vegetation is generally restricted to the shallows. Bottom sediments consist of mud, sand, cobble, gravel, and organic debris. Open water classes for this analysis include lakes, ponds, streams, and rivers. There are 4,387 acres of open water habitat are present in the study corridor. Open water areas are generally evenly distributed across all subbasins in the 0.5-mile buffer study corridor.

Unknown

Unknown wetland habitat areas are the third most common type of wetland found within the study corridor. The Burnt River subbasin contains approximately 1,198 acres of this community type, a majority of the acres identified in the study corridor. Wetlands identified as "unknown" are characterized as polygons that have a high probability of containing a wetland feature. These polygons were not previously captured through NWI photointerpretation, observed with field surveys or identified by other review methods. There are 2,354 acres of unknown wetland habitat are present in the study corridor. Unknown wetlands are presented only for a qualitative assessment of areas of potential resource and are not evaluated quantitatively.

Surface Drinking Water Source Areas

Surface DWSA generally are distributed evenly throughout the B2H Project area, with a concentration of surface-water source areas in the Power River subbasin between Baker and Union counties (Table 3-64). The Columbia River, located to the north of the B2H Project area, is a major supplier in this region. Surface-water source areas include reservoirs, lakes, and rivers and include only mapped public systems. Some pretreatment may be required prior to use. Table 3-64 includes total acres of surface-water DWSA by subbasin in the study corridor.

Table 3-64. Total Acres of Surface Water Drinking Water Source Areas by Subbasin in the Study Corridor				
County	**Subbasin**	**Total Acres of Drinking Water Resource Areas**	**Total Subbasin Acres**	**Percent of Subbasin Acres of Drinking Water Source Areas**
Adams, Baker, Malheur, Wallowa, Washington	Brownlee Reservoir	1,362	833,878	0.4
Malheur	Bully	839	375,014	0.1
Baker, Grant	Burnt	4,021	703,634	0.7
Malheur	Lower Malheur	3,019	607,033	0.2
Malheur	Lower Owyhee	148	1,264,289	0.01
Morrow, Umatilla	Middle Columbia-Lake Wallula	7,979	1,641,881	0.5
Ada, Canyon, Owyhee, Malheur	Middle Snake-Succor	10,437	1,498,734	0.9
Baker, Union	Powder	117,101	1,093,024	7.2
Umatilla, Morrow	Umatilla	21,665	1,616,448	2.0
Union	Upper Grande Ronde	10,731	1,047,238	2.2
Malheur	Willow	795	486,196	0.1
	Total	178,097	11,167,369	–

Several design features will be incorporated into the POD to avoid or minimize impacts on areas mapped as surface DWSA, including Design Feature 1 (Plan of Development), Design Feature 5 (Spatial Extent of Construction Activities) and Design Feature 6 (Reclaim Construction Areas). In addition, the Applicant has committed to using municipal sources of water for B2H Project construction, operation, and maintenance when necessary. Further analysis of this resource is not carried forward.

Groundwater

Shallow Groundwater

Groundwater occurs in several major confined aquifers throughout the study corridor. Northeastern Oregon is underlain by the southern portion of the Columbia Plateau aquifers, and central-eastern Oregon is underlain by the Pacific Northwest aquifers. Southwestern Idaho is underlay by the Snake River Plain aquifer. Shallow groundwater can occur above the regional aquifers, usually from infiltration from surface-water sources. In agricultural areas in the Middle Snake Subbasin, the quantity of shallow groundwater may be enhanced by the flood irrigation.

Groundwater well data from the USGS National Water Information System (USGS 2016a) for Boise, Idaho (the closest monitoring station to the study corridor), shows that groundwater depths vary from approximately 5 feet below ground level to more than 25 feet below ground level. The reporting station is located on the northeastern edge of the Boise River Floodplain.

The OWRD maintains several state-monitored depth to groundwater wells within the study corridor along the Interstate 84 (I-84) corridor (OWRD 2016). Hydrographs indicate that the average depth to groundwater near the Baker City area is within 10 feet below ground surface. Hydrographs for other

well locations in Umatilla, Baker, and Morrow counties indicate average depth to groundwater starting at 50 feet below ground surface to more than 100 feet below ground surface.

Depth to groundwater table readings are estimates of the upper limit of groundwater, generally based on observations of the water table at selected sites and on evidence of a saturated zone. A saturated zone that lasts for less than a month is not considered a water table (USDA 2016a). NRCS data are predictive in nature; are not indicative of real time conditions; and do not factor in local conditions, such as perched water tables, recent deep excavations into local aquifers, or water well drawdown activity.

The lack of consistent groundwater-monitoring stations reporting actual depth to groundwater measurements throughout the B2H Project area leads to an inconclusive assessment of potential impacts on groundwater resources. Where water wells with current depth to groundwater data do occur, the groundwater-monitoring stations are generally clustered near population centers. The majority of the study corridor is located in rural, upland areas where it is unlikely that shallow groundwater is to be encountered during B2H Project activities. However, locally shallow groundwater may exist in some low-lying areas along floodplains, wetlands, and in river bottoms.

The USDA NRCS Web Soil Survey (USDA 2016a) uses a predictive model for estimating depth to groundwater, based on soil taxonomy. Table 3-65 includes a summation of soil unit types classified as either shallow (soil mapping units with predicted groundwater within 6.5 feet below ground surface) and deep (soil mapping units with predicted groundwater deeper than 6.5 feet below ground surface).

Table 3-65. Acres of Shallow and Deep Natural Resources Conservation Service Soil Unit Types by County

County	Subbasin Name	Soil Unit Type	Acres of Soil Unit Type by County	Percent of Total Acres in County
Ada	Middle Snake-Succor	Shallow	26,928	4
		Deep	651,856	96
Adams/Washington (parts of)	Brownlee Reservoir	Shallow	46,260	4
		Deep	1,063,315	96
Baker	Brownlee Reservoir, Burnt, Powder	Shallow	109,510	8
		Deep	1,230,795	92
Canyon	Middle Snake-Succor	Shallow	75,513	16
		Deep	382,041	84
Grant	Burnt	No natural resources conservation service depth to groundwater data		
Malheur (Northeastern Portion only)	Brownlee Reservoir, Bully, Lower Malheur, Lower Owyhee, Middle Snake-Succor, Willow	Shallow	61,023	26
		Deep	173,473	74
Morrow	Middle Columbia-Lake Wallula, Umatilla	Shallow	7,915	0.6
		Deep	1,302,583	99.4
Owyhee	Middle Snake-Succor	Shallow	76,227	2
		Deep	3,631,715	98
Umatilla	Middle Columbia-Lake Wallula, Umatilla	Shallow	74,605	4.6
		Deep	1,580,199	95.4

Table 3-65. Acres of Shallow and Deep Natural Resources Conservation Service Soil Unit Types by County				
County	**Subbasin Name**	**Soil Unit Type**	**Acres of Soil Unit Type by County**	**Percent of Total Acres in County**
Union	Powder, Upper Grande Ronde	Shallow	144,253	22
		Deep	506,950	78
Wallowa	Brownlee Reservoir	Shallow	338,450	35
		Deep	848,113	88

Geotechnical investigations to confirm depth to groundwater throughout the B2H Project area have not been conducted at this time. Geotechnical investigations will be conducted during the preconstruction surveys and would be used to characterize the geologic composition where B2H Project facilities are proposed and to identify areas of shallow groundwater. Micro-siting of facilities then would occur to avoid or minimize impacts on areas of shallow groundwater.

A more detailed analysis of shallow groundwater is provided in Section 3.2.2.4.

Groundwater Drinking Water Source Areas

Groundwater is the major drinking water source in southern Idaho, and a combination of surface water and groundwater provides drinking water in eastern Oregon. Groundwater commonly is available to shallow wells that are completed in unconsolidated-deposit aquifers that consist primarily of sand and gravel but also contain variable quantities of clay and silt. In many places, deeper wells produce water from underlying volcanic rocks, usually basalt (USGS 1994). Groundwater levels in a few areas have declined as a result of withdrawals by wells.

The B2H Project area crosses several groundwater DWSA (Table 3-66), predominantly in Baker County and, to a lesser extent, in Union County (ODEQ and ODHS 2011). In Baker City, the water table ranges from less than 10 to 50 feet below ground surface. Shallow wells yield water from unconsolidated-deposit aquifers; deeper wells yield water from basaltic-rock aquifers for public-supply, domestic and commercial, and agricultural purposes. The wells range in depth from approximately 10 feet to more than 650 feet (USGS 1994). Other source areas include the Blue Bucket Recreational Vehicle Park, City of Huntington, ODOT Weatherby Rest Area, Oregon Parks and Recreation Department (OPRD) Hilgard Junction State Park, Oregon Youth Authority Hilgard, Portland General Electric Boardman Coal Fire Plant, and U.S. Army Depot-Umatilla.

Table 3-66. Acres of Groundwater Drinking Water Source Areas by County	
County	**Groundwater Drinking Water Source Areas**
Baker (Oregon)	8,319
Malheur (Oregon)	84
Morrow (Oregon)	0
Umatilla (Oregon)	139
Union (Oregon)	117
Owyhee (Idaho)	0
Total Acres	8,659

As stated previously, geotechnical investigations to confirm depth to groundwater throughout the B2H Project area have not been conducted at this time. Geotechnical investigations will be conducted during preconstruction surveys and would be used to characterize the geologic composition where B2H Project facilities are proposed and to identify areas of groundwater presence. Micro-siting of facilities, including tower foundations and other B2H Project facilities that may require blasting, would occur to avoid or minimize impacts on areas of shallow groundwater. In addition, the Applicant has committed to using municipally sourced water for construction, operation, and maintenance of the B2H Project. Impacts on groundwater drinking water sources are not anticipated to be affected by local well drawdown due to B2H Project activities.

Further analysis of B2H Project effects on groundwater DWSAs is not carried forward.

Water Wells

There were 352 groundwater wells identified in the study corridor (Table 3-67). As shown in the table below, mapped water wells are not evenly dispersed throughout the study corridor. The Umatilla subbasin contains the majority of mapped water wells (171).

Table 3-67. Total Mapped Water Wells by Subbasin in the Study Corridor

Subbasin	Number of Water Wells
Brownlee Reservoir	0
Bully	0
Burnt	0
Lower Malheur	0
Lower Owyhee	0
Middle Columbia-Lake Wallula	84
Middle Snake-Succor	92
Powder	3
Umatilla	171
Upper Grande Ronde	0
Willow	2
Total	352

Preconstruction surveys will be conducted as part of the POD to identify sensitive resources to be avoided to the maximum extent practicable. The Applicant also has committed to several design features to minimize impacts on water wells due to construction or blasting activities associated with B2H Project construction. Design Feature 1 (Plan of Development) and Design Feature 5 (Spatial Extent of Construction Activities), would avoid or limit effects of blasting on existing water wells within the B2H Project footprint. Further analysis of B2H Project effects on water wells is not carried forward.

Floodplains

Some of the streams that the alternative route centerlines cross have delineated 100-year floodplains or flood hazard areas designated by FEMA. The 100-year floodplain is the area that would be inundated by a flood event having a 1 percent chance of being equaled or exceeded in any given year (also

referred to as the 100-year flood). Table 3-68 provides a breakdown of flood hazard areas within each subbasin crossed by the B2H Project centerline.

Areas within the study corridor that have been identified as having moderate and high flood hazard include the following:

- Willow Creek (near Cecil, Oregon) and Sixmile Canyon and tributaries (between Cecil and Boardman, Oregon) in Morrow County
- Butter Creek and tributaries (Pine City and Hermiston, Oregon) in Morrow and Umatilla counties
- Alkali Canyon (upstream of Echo, Oregon) in Umatilla County, Birch and McKay creeks (between Pilot Rock and Pendleton, Oregon), and the Grande Ronde River (near La Grange, Oregon)
- Powder River tributaries (near Baker, Oregon) and Burnt River Mountain area and tributaries (near Pleasant Valley, Durkee, Weatherby, Dixie, Lime, and Huntington, Oregon) in Baker County
- Willow Creek (near Brogan, Oregon), Malheur River (near Vale, Oregon), and Owyhee River (upstream of Owyhee, Oregon) in Malheur County
- Several tributaries of the Snake River (between Marsing and Melba, Idaho) in Owyhee County

Building is permitted in flood-prone areas with certain restrictions. For instance, buildings may be elevated such that the lowest floor is above the 100-year flood level, and an area of the watercourse (the floodway) is set aside for flow conveyance. Since floodplain mapping usually is done as an aid to local governments in urban areas or in areas that are expected to be prone to urbanization, most watercourses in nonurban areas are unmapped even though they may be subject to flood hazards. It is reasonable to assume that all watercourses that convey natural flows, whether or not mapped as floodplains or flood hazard areas, present some level of flood hazard. The flood hazard is not limited to inundation; bank erosion and bed scour (a lowering or destabilization of the channel bed during a flow event) also are hazards that can occur due to flooding. Further analysis of floodplains is provided under Section 3.2.1.5.

Table 3-68. Acres of Flood Hazard Areas by Hazard Rank Subbasin in the Study Corridor

Subbasin	Flood Hazard Rank Moderate Within 1 Mile Buffer	Flood Hazard Rank Moderate Within Hydrologic Unit Code 8, 1-mile Buffer	Flood Hazard Rank High Within 1 Mile Buffer	Flood Hazard Rank High Within Hydrologic Unit Code 8 Within 1-mile Buffer
Brownlee Reservoir	6,102	47,123	2,082	85,283
Bully	0	6,070	0	426
Burnt	9,349	38,488	73	5,515
Lower Malheur	1,158	66,019	42,613	0
Lower Owyhee	2,015	123,200	801	98,805
Middle Columbia-Lake Wallula	0	378,433	0	233,639
Middle Snake-Succor	646	60,527	1,715	163,831
Powder	2,226	50,886	0	18,643

Table 3-68. Acres of Flood Hazard Areas by Hazard Rank Subbasin in the Study Corridor				
Subbasin	**Flood Hazard Rank Moderate Within 1 Mile Buffer**	**Flood Hazard Rank Moderate Within Hydrologic Unit Code 8, 1-mile Buffer**	**Flood Hazard Rank High Within 1 Mile Buffer**	**Flood Hazard Rank High Within Hydrologic Unit Code 8 Within 1-mile Buffer**
Umatilla	10,584	143,192	10,859	198,008
Upper Grande Ronde	458	40,406	77	8,430
Willow	1,195	35,968	1,652	13,154

Traditional Foods and Water Resources

Water is a resource that is required to produce and support all traditional foods. Water quality includes processes associated with the sustained longevity of traditional foods, including plant, wildlife and fish traditional foods. The physical, chemical, and biological aspects of water quality compose a sustainable river system (Jones et al. 2008). Rivers and streams should be free from pollutants (e.g., toxicants or excess nutrients) that impair drinking water supplies, alter stream-water pH, and stress or kill native aquatic fauna. Maintenance of appropriate water temperature regimes, including cool temperatures during the summer, is especially important because water temperature influences dissolved oxygen concentrations, stress levels of aquatic organisms, growth of pathogens, and the competitive abilities of non-native fishes and native fishes.

Water quality must be adequate to support the sustainable production of traditional foods in terms of its physical properties (e.g., having an appropriate temperature regime), chemical composition (e.g., being free of pollutants), biotic constituents (e.g., having a native biotic community), and hydrology (e.g., having proper timing and adequate volume of river flow and spatial distribution of water throughout the basin) (Jones et al. 2008).

Water quality has been degraded across the B2H Project area by inputs of sediment, fertilizers, pesticides, and other contaminants in areas of development, including areas of agriculture, residential, and commercial expansion. Possible consequences of these inputs include altering the food web by increasing the growth of noxious weeds and algae, which could lead to the accumulation of contaminants in water, sediment, and aquatic organisms.

Conservation measures for the B2H Project to reduce negative effects on water quality include design features for environmental protection and selective mitigation measures that are applied to mitigate site- and/or resource-specific impacts of the B2H Project (Refer to Section 3.2.2.4). As a result, impacts on traditional foods are anticipated to be minimal.

Further discussion of traditional foods is provided under Section 3.2.3.5, Section 3.2.4.5, and Section 3.2.5.5.

SEGMENT 1—MORROW-UMATILLA

Segment 1 begins in the Middle Columbia-Lake Wallula subbasin in the northwest, crosses the Umatilla subbasin and concludes in the Upper Grande Ronde subbasin to the southeast.

Streams and Impaired Waters

Segment 1 begins in the Columbia Plateau major land resource area (MLRA) in the Middle Columbia-Lake Wallula subbasin (USDA 2016b). The Columbia Plateau MLRA is characterized by smooth to deeply dissected plains and plateaus containing rolling hills with incised valleys. This MLRA is in the rain shadow of the Cascade Mountain Range, and, thus receives a low to moderate amount of precipitation typically occurring as rain in fall, winter, and spring from low-intensity, Pacific frontal storms. This MLRA receives some of the lowest total precipitation in the ecoregion. Surface water is abundant throughout most of the region and is dominated by the runoff from snowmelt. The major rivers provide water for irrigation along their courses, but small streams provide little water.

Segment 1 continues south through to the Umatilla subbasin and the Columbia Basin MLRA. The Columbia Basin MLRA is smooth, gently sloping plain broken by some steep basalt ridges (USDA 2016b). The smooth plain also is dissected into large areas by rivers and perennial streams. This MLRA is on the lee side of the Cascade Mountains and is the warmest and driest MLRA in the entire Columbia Plateau geographic area. Two-thirds of the precipitation occurs in winter from low-intensity, Pacific frontal storms. The winter precipitation typically occurs as a mixture of rain and snow, and summers are generally dry. Surface water is abundant throughout most of the region; however it is generally confined to intermittent streams.

Streams in this Segment drain to the Columbia River to the north (USDA 2016c). Several major streams are crossed by alternative routes in this segment, including the Umatilla River, West Birch Creek and Beaver Creek.

Table 3-69 presents the miles of streams by periodicity and by impairment status crossed by all alternative routes and variations in Segment 1. The distribution of these stream types in Segment 1 is displayed on MV-6.

Table 3-69. Streams Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length	Perennial Streams	Intermittent Streams	Total Miles of Streams Crossed
Applicant's Proposed Action	91.9	1.4	19.8	21.2
Variation S1-B1	*6.4*	*0.2*	*1.8*	*2.0*
Variation S1-B2	*6.4*	*0.4*	*1.8*	*2.2*
East of Bombing Range Road	92.3	1.4	19.5	20.9
Applicant's Proposed Action – Southern Route	99.1	1.7	20.5	22.2
West of Bombing Range Road – Southern Route	95.6	2.4	16.6	19.0
Longhorn	88.2	1.5	17.4	18.9
Interstate 84	84.7	1.4	13.1	14.8
Variation S1-A1	*18.5*	*0.2*	*3.0*	*3.2*
Variation S1-A2	*18.5*	*0.2*	*3.8*	*4.0*
Interstate 84 – Southern Route	93.4	2.0	14.4	16.4

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative predominantly crosses intermittent streams and does not cross any 303(d) impaired waters.

Variations S1-B1 and S1-B2

Variation S1-B1 crosses both intermittent and perennial streams, and Variation S1-B2 crosses twice the distance of perennial streams and the same distance of intermittent streams as Variation S1-B1.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross any perennial or intermittent streams or 303(d) impaired waters.

East of Bombing Range Road Alternative

Both intermittent and perennial streams are crossed by the East of Bombing Range Road Alternative. The East of Bombing Range Road Alternative crosses fewer total miles of streams than the Applicant's Proposed Action Alternative. This alternative route crosses the West Irrigation Canal near the northern terminus of the alternative route (Link 1-7) and does not cross any 303(d) impaired waters.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative crosses more miles of both perennial and intermittent streams than the Applicant's Proposed Action Alternative. This alternative route crosses the West Irrigation Canal near the northern terminus of the alternative route (Link 1-7) and crosses the most total miles of streams in Segment 1. The alternative route does not cross any 303(d) impaired waters.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross any perennial or intermittent streams or 303(d) impaired waters.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Alternative crosses more miles of perennial streams, but fewer miles of intermittent streams, than the Applicant's Proposed Action Alternative. This alternative route crosses fewer total miles of streams than the Applicant's Proposed Action Alternative and does not cross any 303(d) impaired waters.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross any perennial or intermittent streams or 303(d) impaired waters.

Longhorn Alternative

The Longhorn Alternative crosses more miles of perennial streams, but fewer miles of intermittent streams than the Applicant's Proposed Action Alternative. This alternative route crosses the West Irrigation Canal near the northern terminus of the alternative route (Link 1-7). The Longhorn Alternative

crosses fewer total miles of streams than the Applicant's Proposed Action Alternative and does not cross any 303(d) impaired waters.

Interstate 84 Alternative and Variations

The Interstate 84 Alternative crosses fewer total miles of streams than the Applicant's Proposed Action Alternative and does not cross any 303(d) impaired waters. This alternative route crosses the Umatilla River (Link 1-23).

Variations S1-A1 and S1-A2

Variation S1-A1 crosses fewer total miles of streams than Variation S1-A2. Both variations do not cross any 303(d) impaired waters.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative crosses more miles of perennial streams than the Applicant's Proposed Action Alternative, including the Umatilla River (Link 1-23). This alternative route crosses fewer total miles of streams than the Applicant's Proposed Action Alternative and does not cross any 303(d) impaired waters.

Wetlands

The Columbia Plateau MLRA supports a variety of shrub-grass associations that are landscape dependent and position dominant; areas of moderately deep to deeply sloping hills with south facing exposures generally support wheatgrasses and sagebrush associations (USDA 2013, 2016b). Small stands of trees and taller shrubs are associated with warmer sites along the major rivers, on north-facing slopes, in canyons and draws, and along stream channels in linear depressed landscapes. Moderate height shrub communities predominantly grow in canyons and draws.

The Columbia Basin MLRA, within the Umatilla subbasin, supports selective shrub-grass associations that do not require consistent water input (USDA 2016b). Forests and scrub-shrub wetlands are rare and limited to areas of reliable, consistent water sources (perennial streams within topographically defined landscapes, groundwater driven wetlands, springs).

Springs are located throughout Segment 1, however they are inconsistently associated with rolling landform features. The Echo Meadows and Umatilla Meadows areas are located along Interstate 84 in this segment (Link 1-23).

Table 3-70 presents the miles of wetland types crossed by all alternative routes and variations in Segment 1. The distribution of these wetland communities in Segment 1 is displayed on MV-6.

Table 3-70. Wetland Resources Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length	Forested Wetlands	Scrub-Shrub Wetlands	Emergent Wetlands	Open Water	Total Miles of Wetlands Crossed
Applicant's Proposed Action	91.9	0.3	0.1	2	2.3	4.7
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.1*	*0.0*	*0.1*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.4*	*0.4*

Table 3-70. Wetland Resources Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)						
Alternative Route	**Total Length**	**Forested Wetlands**	**Scrub-Shrub Wetlands**	**Emergent Wetlands**	**Open Water**	**Total Miles of Wetlands Crossed**
East of Bombing Range Road	92.3	0.3	0.1	2.1	2.1	4.6
Applicant's Proposed Action – Southern Route	99.1	0.7	0.1	2.0	4.0	6.8
West of Bombing Range Road – Southern Route	95.6	0.9	0.1	2.5	3.8	7.3
Longhorn	88.2	0.1	0.1	2.5	1.9	4.6
Interstate 84	84.7	0.1	0.4	2.9	4.8	8.2
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.6*	*0.6*
Variation S1-A2	*18.5*	*0.0*	*0.1*	*0.1*	*0.9*	*1.1*
Interstate 84 – Southern Route	93.4	0.5	0.4	2.9	6.4	10.2
Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.						

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative predominantly crosses open water and emergent wetlands associated with open water fringe areas.

Variations S1-B1 and S1-B2

Variation S1-B1 crosses only emergent wetlands and crosses fewer total miles of wetlands than Variation S1-B2. Variation S1-B2 only crosses open water wetlands.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross any wetland types.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative crosses emergent and open water wetlands. This alternative route crosses the West Irrigation Canal) near the northern terminus of the alternative route (Link 1-7).

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative crosses more miles of open water and forested wetlands than the Applicant's Proposed Action Alternative. This alternative route crosses the West Irrigation Canal near the northern terminus of the alternative route (Link 1-7).

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross any wetland types.

West of Bombing Range Road – Southern Route Alternative

The West Bombing Range Road – Southern Route Alternative crosses the most miles of forested wetlands in Segment 1 and crosses Butter Creek (Link 1-38) and the associated emergent and forested wetlands.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross any wetland types.

Longhorn Alternative

The Longhorn Alternative crosses the West Irrigation Canal near the northern terminus of the alternative route (Link 1-9) and crosses mostly emergent wetlands associated with agricultural areas.

Interstate 84 Alternative and Variations

The Umatilla Meadows and Echo Meadows areas (Link 1-23) split Interstate 84 north and south, respectively, near the locality of Echo. Large tracts of emergent wetlands, associated with existing agricultural fields, are located throughout this area. The Umatilla River crosses I-84 and the Interstate 84 Alternative to the east of the Echo Meadow area (Link 1-23). This area represents the highest concentration of emergent wetlands in Segment 1.

Variations S1-A1 and S1-A2

Variation S1-A1 only crosses open water wetlands. Variation S1-A2 crosses more total miles of wetlands than Variation S1-A1, including open water, emergent, and scrub-shrub wetlands.

Interstate 84 – Southern Route Alternative

Wetland types crossed by this alternative route consist mostly of open water and associated emergent fringe wetlands. This alternative route crosses the most total miles of wetlands compare to any of the other alternative routes in Segment 1.

SEGMENT 2—BLUE MOUNTAINS

Segment 2 begins in the Wallowa-Whitman National Forest in the northwest and runs generally to the southeast, crossing the Grande Ronde River and Rock Creek in the Upper Grande Ronde River subbasin and the Powder River, Jimmy and Clover Creeks in the Powder River subbasin. Segment 2 ends near Riverdale Hill, just south of the Baker/Union County boundary. Streams in this Segment drain to the Snake River to the north.

Segment 2 starts in the Upper Grande Ronde subbasin and crosses into the crosses the Palouse and Nez Perce Prairies MLRA (USDA 2016b). This MLRA is on the lee side of the Cascade Mountains and is characterized by an area of smooth to deeply dissected plains and plateaus, with locally undulating basalt plateau landscapes that are nearly level to steeply sloping. Local watersheds are further characterized by a surface that is moderately dissected or strongly dissected by intermittent streams. Slopes are mostly hilly and steep. Winter precipitation, primarily snow, occurs during low-intensity, Pacific frontal storms. High-intensity, convective thunderstorms produce some rain during the growing season. Precipitation is evenly distributed throughout fall, winter, and spring. Summers are relatively dry. Surface water runoff is dominated by snowmelt; in years of light snowpack many streams can run dry.

Segment 2 continues through to the Upper Snake River Lava Plains between the Grand Ronde subbasin and the Power River subbasin (USDA 2016b). This MLRA is typified by gently rolling to steep

hills, plateaus, and low mountains. Precipitation is evenly distributed throughout fall, winter, and spring but is low in summer. Some high-intensity, convective thunderstorms occur during the growing season. Winter precipitation is primarily snow. This MLRA is generally drier than the Palouse and Nez Perce Prairies MLRA to the north. Surface water is abundant throughout most of the region and occurs as smaller volume perennial rivers and intermittent streams.

Streams and Impaired Waters

Table 3-71 presents the miles of streams by periodicity and by impairment status crossed by all alternative routes and variations in Segment 2. The distribution of these stream types in Segment 2 is displayed on MV-6.

Table 3-71. Streams and Impaired Waters Inventory Data for Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length	Perennial Streams	Intermittent Streams	Temperature-Impaired Streams (303(d) listed)	Total Miles of Streams Crossed
Applicant's Proposed Action	33.8	2.2	5.6	0.2	7.8
Variation S2-A1	*2.8*	*0.0*	*0.7*	*0.0*	*0.7*
Variation S2-A2	*2.9*	*0.0*	*1.4*	*0.0*	*1.4*
Variation S2-B1	*3.7*	*0.8*	*0.7*	*0.0*	*1.5*
Variation S2-B2	*3.8*	*0.7*	*0.8*	*0.0*	*1.5*
Variation S2-C1	*9.3*	*0.3*	*0.7*	*0.0*	*1.0*
Variation S2-C2	*8.8*	*0.6*	*0.5*	*0.0*	*1.1*
Variation S2-E1	*2.3*	*0.6*	*0.7*	*0.0*	*1.3*
Variation S2-E2	*2.6*	*0.7*	*0.2*	*0.0*	*0.9*
Variation S2-F1	*12.1*	*0.0*	*0.3*	*0.0*	*0.3*
Variation S2-F2	*12.2*	*0.1*	*0.2*	*0.0*	*0.3*
Glass Hill	33.7	2.6	5.5	0.2	8.1
Variation S2-D1	*4.3*	*0.7*	*2.1*	*0.2*	*2.8*
Variation S2-D2	*4.1*	*1.1*	*1.6*	*0.2*	*2.7*
Mill Creek	34.0	2.4	5.4	0.2	7.8

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

For the Applicant's Proposed Action Alternative, streams drain to the Grande Ronde River and, eventually, the Snake River to the north. The Applicant's Proposed Action Alternative crosses the Grande Ronde River (Link 2-20), Rock Creek (Link 2-35), Sheep Creek (Link 2-45), Clover Creek and the Powder River (Link 2-85). This alternative route predominantly crosses intermittent streams.

Variations S2-A1 and S2-A2

Variations S2-A1 and S2-A2 cross only intermittent streams on the Wallowa-Whitman National Forest (Links 2-5 and 2-7, respectively) and do not cross any perennial or 303(d) impaired waters. Variation S2-A2 crosses approximately twice the miles of intermittent streams as Variation S2-A1.

Variations S2-B1 and S2-B2

Variation S2-B1 crosses both Rock and Sheep Creeks while Variation S2-B2 crosses Rock, Sheep, and Graves (tributary to Rock Creek) creeks (Links 2-25 and 2-35, respectively). Variation S2-B1 crosses slightly more miles of perennial streams and slightly fewer miles of intermittent streams than Variation S2-B2. These variations do not cross any 303(d) impaired waters.

Variations S2-C1 and S2-C2

Variations S2-C1 and S2-C2 cross Sheep Creek (Link 2-48) and Variation S2-C2 also crosses an unnamed-mapped tributary to Rock Creek (Link 2-45). Variation S2-C1 crosses fewer miles of perennial and intermittent streams than Variation S2-C2. These variations do not cross any 303(d) impaired waters.

Variations S2-E1 and S2-E2

Variation S2-E1 crosses an unnamed perennial stream near the southern terminus of the variation, and Variation S2-E2 crosses an unnamed perennial stream (tributary to Ladd Canyon Pond) (Link 2-55). Variation S2-E1 crosses fewer miles of perennial streams and approximately three times the distance of intermittent streams than Variation S2-E2. These variations do not cross any 303(d) impaired waters.

Variations S2-F1 and S2-F2

Variations S2-F1 and S2-F2 cross Clover and Jimmy Creeks (Links 2-70 and 2-75, respectively) and the Powder River (Links 2-90 and 2-95, respectively) before terminating just north of Riverdale. Variation S2-F1 crosses slightly more miles of intermittent streams than Variation S2-F2, and Variation S2-F2 crosses slightly more miles of perennial streams than Variation S2-F1. These variations do not cross any 303(d) impaired waters.

Glass Hill Alternative and Variations

The Glass Hill Alternative and variations cross within more of the headwaters areas of Rock and Graves Creeks than the Applicant's Proposed Action Alternative. The Glass Hill Alternative crosses the upstream portion of the Jimmy Creek Reservoir (Link 2-85).

The Glass Hill Alternative crosses more miles of perennial streams, fewer miles of intermittent streams, and the same distance of 303(d) temperature-impaired streams as the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

Variations S2-D1 and S2-D2 cross Graves, Rock and Little Rock Creeks (Links 2-42 and 2-46, respectively). Variation S2-D1 crosses fewer miles of perennial streams, more miles of intermittent streams, and the same distance of 303(d) temperature-impaired streams than Variation S2-D2 (Rock Creek).

Mill Creek Alternative

The Mill Creek Alternative crosses the Grande Ronde River (Link 2-10), Rock Creek (Link 2-10), Mill Creek (Link 2-12), Jimmy Creek (Link 2-83), Ladd Creek (Link 2-83), Pickup Ditch (Link 2-85) and Powder River (Link 2-85). This alternative route crosses more miles of perennial streams, fewer miles

of intermittent streams, and the same distance of 303(d) temperature-impaired streams than the Applicant's Proposed Action Alternative.

Wetlands

The Palouse and Nez Perce Prairies MLRA supports a mix of grass, shrubs, and trees, with more forested communities concentrated near perennial water sources and areas of shallow groundwater (USDA 2016b). True forested wetlands are exceptionally rare due to lack of year-round water sources; most wetlands within this MLRA consist of scrub-shrub, emergent or open water types.

The Upper Snake River Lava Plains MLRA supports many types of shrub-grass associations, a typical vegetative community found in drier ecoregions (USDA 2016b). Forested areas are rare and occur in perennial stream corridors and natural groundwater driven springs.

The Ladd Marsh Wildlife Area and associated wetland meadows (Map 3-1) are located in this segment (Links 2-48 and 2-83). The Clover Creek Valley and floodplain areas also are located in the southern portion of Segment 2. No mapped forested wetlands are crossed in Segment 2 by any alternative route or variation.

Table 3-72 presents the wetland types crossed by all alternative routes and variations in Segment 2. The distribution of these wetland community types in Segment 2 is displayed on MV-6.

Table 3-72. Wetland Resources Inventory Data for Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length	Forested Wetlands	Scrub-Shrub Wetlands	Emergent Wetlands	Open Water	Total Miles of Wetland
Applicant's Proposed Action	33.8	0.0	0.7	1.7	2.2	4.6
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.5*	*0.5*	*1.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.7*	*0.7*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.1*	*0.2*	*0.3*
Variation S2-C2	*8.8*	*0.0*	*0.1*	*0.0*	*0.3*	*0.4*
Variation S2-E1	*2.3*	*0.0*	*0.1*	*0.0*	*0.4*	*0.5*
Variation S2-E2	*2.6*	*0.0*	*0.1*	*0.0*	*0.5*	*0.6*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*
Variation S2-F2	*12.2*	*0.0*	*0.1*	*0.1*	*0.0*	*0.2*
Glass Hill	33.7	0.0	1.0	1.7	2.2	4.9
Variation S2-D1	*4.3*	*0.0*	*0.6*	*1.1*	*1.0*	*2.7*
Variation S2-D2	*4.1*	*0.0*	*0.1*	*0.3*	*1.0*	*1.4*
Mill Creek	34.0	0.0	0.6	0.9	2.5	4.0

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative predominantly crosses open water and associated emergent wetlands. This alternative route crosses the headwaters areas of Rock and Graves Creeks and the upstream watershed of the Jimmy Creek Reservoir (Link 2-85).

Variations S2-A1 and S2-A2

Variation S2-A1 does not cross any wetlands and Variation S2-A2 crosses a small area of open water wetlands.

Variations S2-B1 and S2-B2

Variation S2-B1 crosses more miles of emergent wetlands and fewer miles of open water wetlands than Variation S2-B2.

Variations S2-C1 and S2-C2

Variation S2-C1 crosses fewer total miles of wetlands than Variation S2-C2; however this variation crosses more miles of emergent wetlands and fewer miles of open water wetlands than Variation S2-C2.

Variations S2-E1 and S2-E2

Variation S2-E1 crosses fewer total miles of wetlands than Variation S2-E2. Variations S2-E1 and S2-E2 cross scrub-shrub and open water wetlands, with Variation S2-E2 crossing more miles of open water wetlands than Variation S2-E1.

Variations S2-F1 and S2-F2

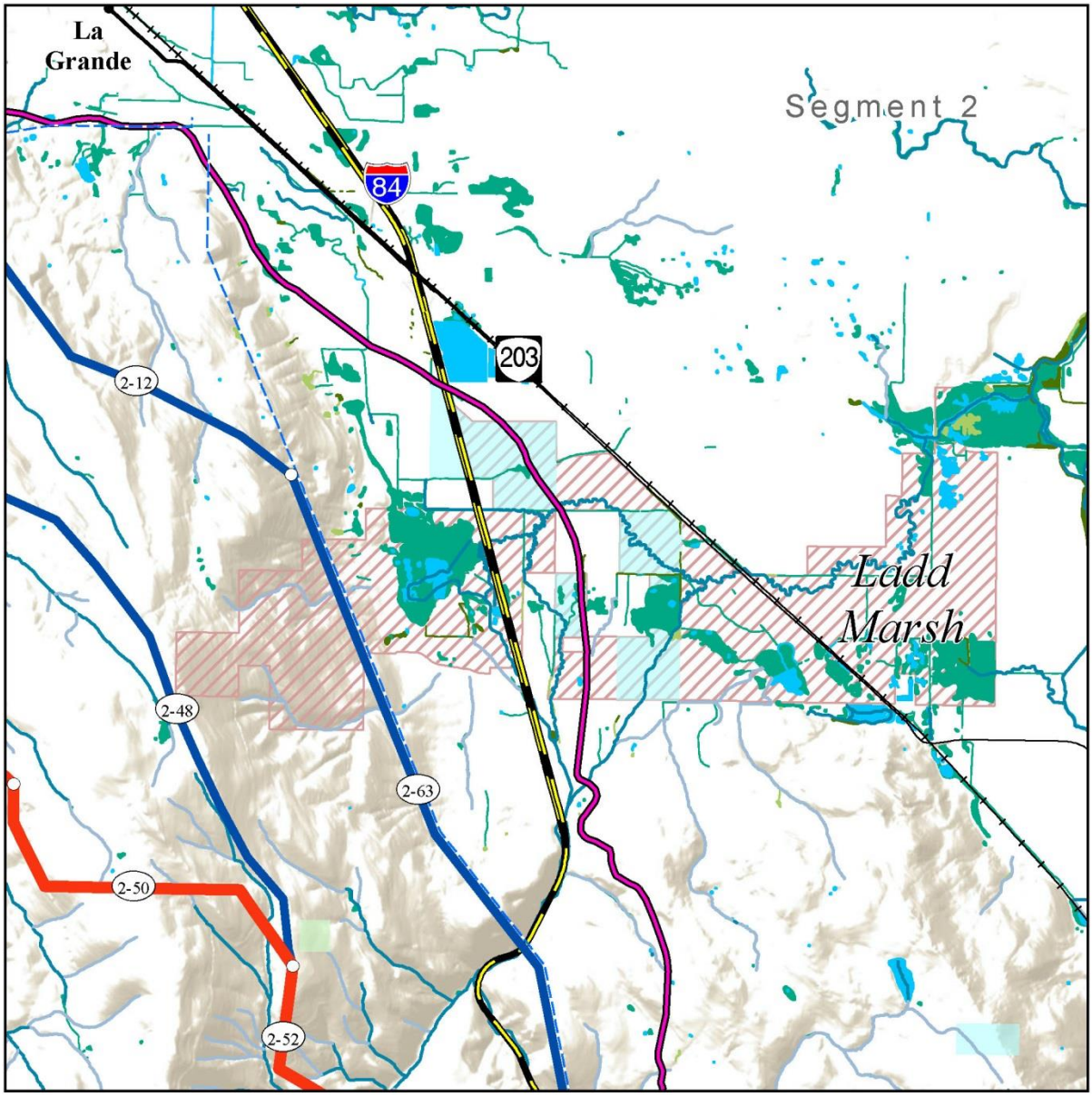
Variation S2-F1 crosses fewer total miles of wetlands than Variation S2-F2. Variation S2-F1 only crosses open water wetlands, and Variation S2-F2 only crosses scrub-shrub and emergent wetlands.

Glass Hill Alternative

The Glass Hill Alternative crosses within more of the headwaters areas of Rock and Graves Creeks (Links 2-40 and 2-42, respectively) in the area crossed by both alternative route variations and crosses the upstream portion of the Jimmy Creek Reservoir (Link 2-80). This alternative route crosses more total miles of wetlands and more miles of scrub-shrub wetlands than the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

Variation S2-D1 crosses approximately three times the miles of emergent wetlands, six times the miles of scrub-shrub wetlands, and the same distance of mapped open water wetlands as Variation S2-D2.



Map 3-1

Ladd Marsh Wildlife Management Area

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Water Features

- Perennial Stream
- Intermittent Stream
- Lake, Pond, or Reservoir
- Emergent Wetland
- Forested Wetland
- Scrub-Shrub Wetland
- Ladd Marsh Wildlife Management Area (WMA)

Project Features

- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node

Land Ownership

- U.S. Forest Service
- State Land
- Private Land

General Reference

- City or Town
- 230-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
National Hydrography Dataset and Aquatic Resources Information Management System, USGS and BLM 2014; Wetlands, USFWS (National Wetlands Inventory) 2014; Oregon State University (OregonExplorer) 2009; Tetra Tech (limited field surveys for wetlands/waters) 2013; Ladd Marsh Wildlife Management Area, ODFW 2014; Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012, Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Wildlife Management Areas, IDFG 2012, ODFW 2014; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The map extent falls entirely within the Upper Grande Ronde subbasin (8-digit Hydrologic Unit Code).
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 0.5 1
Miles
1:80,000 or 1 inch = 1 mile

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Mill Creek Alternative

The Mill Creek Alternative passes through the Ladd Marsh Wildlife Area (Link 2-63) but does not cross any wetland types on the wildlife area. This alternative crosses the Grande Ronde River (Link 2-10) and the Powder River (Link 2-83). The Mill Creek Alternative crosses fewer total miles of wetlands throughout its entire mapped length than the Applicant's Proposed Action Alternative. This alternative route crosses fewer miles of emergent wetlands and scrub-shrub wetlands, and more miles of open water wetlands than the Applicant's Proposed Action Alternative.

SEGMENT 3—BAKER VALLEY

Segment 3 begins in the Powder River subbasin near Riverdale Hill in Baker County and runs generally to the southeast, crossing the Lower Powder Valley near the Missouri Flats into the Durkee Valley, traversing Gentry Creek, the Powder River, Alder Creek and the Burnt River in the Burnt River subbasin, just southeast of Weatherby Mountain. The Timber Canyon Alternative begins near the Applicant's Proposed Action Alternative in the northwest but takes an eastern route, around Thief Valley Reservoir (Link 3-6), southeast through the Wallowa-Whitman National Forest and crosses through the Eagle Valley before ending near Weatherby.

Streams and Impaired Waters

Segment 3 crosses both the Palouse and Nez Perce Prairies and Upper Snake River Lava Plains MLRAs, as described under Segment 2. The Palouse and Nez Perce Prairies MLRA in the Powder River subbasin is characterized by an undulating basalt plateau landscape that is nearly level to steeply sloping, with a surface that is moderately dissected or strongly dissected by streams (USDA 2016b). Slopes are mostly hilly and steep. Winter precipitation, primarily snow, occurs during low-intensity, Pacific frontal storms. High-intensity, convective thunderstorms produce some rain during the growing season. Precipitation is evenly distributed throughout fall, winter, and spring. Summers are relatively dry (USDA 2016b).

Segment 3 crosses back into the Upper Snake River Lava Plains MLRA in the Burnt River subbasin. This MLRA is typified by gently rolling to steep hills, plateaus, and low mountains (USDA 2016b). Precipitation is evenly distributed throughout fall, winter, and spring but is generally low in summer. Some high-intensity, convective thunderstorms occur during the growing season. Winter precipitation is primarily comprised of snow (USDA 2016b). The Upper Snake River Lava Plains MLRA is generally drier than the Palouse and Nez Perce Prairies MLRA. Streams in Segment 3 drain to the Powder River and eventually the Snake River to the north.

Table 3-73 presents the miles of streams by periodicity and impairment status crossed by crossed by all alternative routes and route variations in Segment 3. The distribution of these stream types in Segment 3 is displayed on MV-6. No 303(d) sediment-impaired streams are crossed by any alternative route or route variation in Segment 3.

Table 3-73. Streams and Impaired Waters Inventory Data for Segment 3—Baker Valley (miles crossed)					
Alternative Route	**Total Length**	**Perennial Streams**	**Intermittent Streams**	**Temperature-Impaired Streams (303(d) listed)**	**Total Miles of Streams Crossed**
Applicant's Proposed Action	55.2	4.6	7.0	1.4	11.6
Variation S3-A1	*12.4*	*1.1*	*2.2*	*0.0*	*3.3*
Variation S3-A2	*12.2*	*0.1*	*2.2*	*0.0*	*2.3*
Variation S3-B1	*13.9*	*0.6*	*0.7*	*0.0*	*1.3*
Variation S3-B2	*14.4*	*0.6*	*3.1*	*0.0*	*3.7*
Variation S3-B3	*14.7*	*0.6*	*2.7*	*0.0*	*3.3*
Variation S3-B4	*14.3*	*0.5*	*2.2*	*0.0*	*2.7*
Variation S3-B5	*14.0*	*0.5*	*2.7*	*0.0*	*3.2*
Variation S3-C1	*21.1*	*2.6*	*2.2*	*1.4*	*4.8*
Variation S3-C2	*21.7*	*2.7*	*2.3*	*1.5*	*5.0*
Variation S3-C3	*21.1*	*2.8*	*3.1*	*1.5*	*5.9*
Variation S3-C4	*21.4*	*2.3*	*2.4*	*1.5*	*4.7*
Variation S3-C5	*21.0*	*1.7*	*3.7*	*0.4*	*5.4*
Variation S3-C6	*24.7*	*2.0*	*5.5*	*0.7*	*7.5*
Flagstaff A	55.3	4.5	9.0	1.4	13.5
Timber Canyon	70.3	6.8	12.5	1.8	19.3
Flagstaff A – Burnt River Mountain	55.3	4.7	9.9	1.5	14.6
Flagstaff B	56.0	4.6	9.0	1.4	13.6
Flagstaff B – Burnt River West	55.7	2.7	10.5	0.4	13.2
Flagstaff B – Durkee	59.6	4.0	12.3	0.7	16.3
Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.					

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses approximately twice as many miles of intermittent streams as perennial streams.

Variations S3-A1 and S3-A2

Variation S3-A1 crosses more miles of perennial streams and the same distance of intermittent streams as Variation S3-A2. Neither variation crosses any 303(d) impaired streams.

Variations S3-B1 through S3-B5

Variations S3-B1 through B5 cross perennial and intermittent streams. Variation S3-B2 crosses more total miles of streams than the other variations.

Variations S3-C1 through S3-C6

Variations S3-C1 through S3-C6 cross perennial, intermittent, and 303(d) temperature-impaired streams. Variation S3-C6 crosses more total miles of streams than the other variations.

Flagstaff A Alternative

The Flagstaff A Alternative crosses fewer miles of perennial streams, more miles of intermittent streams, and the same amount of 303(d) temperature-impaired streams than the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The Timber Canyon Alternative crosses more miles of perennial streams, intermittent, and 303(d) temperature-impaired streams than the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative crosses more miles of perennial streams, intermittent, and 303(d) temperature-impaired streams than the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative crosses the same amount of perennial and 303(d) temperature-impaired streams, and more miles of intermittent streams than the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative crosses more miles of intermittent streams and fewer miles of perennial and 303(d) temperature-impaired streams than the Applicant's Proposed Action Alternative.

Flagstaff B - Durkee

The Flagstaff B – Durkee Alternative crosses fewer miles of perennial and 303(d) temperature-impaired streams and more miles of intermittent streams than the Applicant's Proposed Action Alternative.

Wetlands

The Palouse and Nez Perce Prairies MLRA supports a mix of grass, shrubs, and trees throughout, with taller vegetation concentrated near perennial water sources and areas of shallow groundwater (USDA 2016b). Rangeland areas support a shrub-grassland associated plant community.

The Upper Snake River Lava Plains MLRA supports a discrete mix of shrub-grass associations throughout the B2H Project area (USDA 2016b). This is a typical vegetative community type in drier ecoregions. Forested areas occur within perennial stream corridors and natural springs and are rare. Scrub-shrub and emergent wetland communities are confined to areas of consistent water availability – typically perennial stream corridors and localized groundwater seeps associated with springs.

Table 3-74 presents the wetland types crossed by all alternative routes and route variations in Segment 3. The distribution of these wetland types in Segment 3 is displayed on MV-6.

Table 3-74. Wetland Resources Inventory Data for Segment 3—Baker Valley (miles crossed)						
Alternative Route	**Total Length**	**Forested Wetlands**	**Scrub-Shrub Wetlands**	**Emergent Wetlands**	**Open Water**	**Total Miles of Wetlands Crossed**
Applicant's Proposed Action	55.2	0.5	0.4	3.2	5.0	9.1
Variation S3-A1	*12.4*	*0.0*	*0.0*	*1.1*	*0.9*	*2.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.2*	*0.8*	*1.0*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.7*	*0.7*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*1.1*	*1.5*	*2.6*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*1.1*	*1.5*	*2.6*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*1.0*	*1.7*	*2.7*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*1.6*	*1.6*	*3.2*
Variation S3-C1	*21.1*	*0.5*	*0.4*	*1.0*	*2.3*	*4.2*
Variation S3-C2	*21.7*	*0.5*	*0.7*	*0.9*	*2.4*	*4.5*
Variation S3-C3	*21.1*	*0.4*	*0.6*	*2.0*	*3.7*	*6.7*
Variation S3-C4	*21.4*	*0.4*	*0.6*	*1.1*	*3.1*	*5.2*
Variation S3-C5	*21.0*	*0.5*	*0.1*	*0.5*	*3.1*	*4.2*
Variation S3-C6	*24.7*	*1.2*	*0.4*	*0.7*	*4.2*	*6.5*
Flagstaff A	55.3	0.5	0.4	4.8	5.9	11.6
Timber Canyon	70.3	1.5	2.1	4.0	6.6	14.2
Flagstaff A – Burnt River Mountain	55.3	0.4	0.6	5.8	7.3	14.1
Flagstaff B	56.0	0.5	0.4	4.3	5.8	11.0
Flagstaff B – Burnt River West	55.7	0.5	0.1	2.9	6.5	10.0
Flagstaff B – Durkee	59.6	1.2	0.4	4.0	7.7	13.3
Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.						

Applicant's Proposed Action Alternative

The Applicant's Proposed Action predominantly crosses open water and associated emergent wetlands, as well as areas of forested and scrub-shrub wetlands.

Variations S3-A1 and S3-A2

Variations S3-A1 and S3-A2 cross emergent and open water wetlands. Variation S3-A1 crosses more total miles of wetlands than Variation S3-A2.

Variations S3-B1 through S3-B5

Variations S3-B1 through S3-B5 cross open water wetlands. In addition, Variations S3-B2 through S3-B5 cross emergent wetlands. Variation S3-B5 crosses more total miles of wetlands that the other variations.

Variations S3-C1 through S3-C6

Variations S3-C1 through S3-C6 cross forested, scrub-shrub, emergent, and open water wetlands. Variation S3-C3 crosses more total miles of wetlands than the other variations.

Flagstaff A Alternative

The Flagstaff A Alternative crosses the same amount of forested and scrub-shrub wetlands and more miles of emergent and open water wetlands than the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The Timber Canyon Alternative crosses to the north of the Thief Valley Reservoir (Link 3-6). The Timber Canyon Alternative crosses a greater amount of all wetland types than the Applicant's Proposed Action Alternative, and all other alternative routes in Segment 3.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative crosses a greater amount of scrub-shrub, emergent, and open water wetlands, and less forested wetlands than the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative crosses the same amount of forested and scrub-shrub wetlands, and more miles of emergent and open water wetlands than the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative crosses the same amount of forested wetlands, less scrub-shrub and emergent wetlands, and more open water wetlands than the Applicant's Proposed Action Alternative.

Flagstaff B - Durkee

The Flagstaff B – Durkee Alternative crosses more miles of forested wetlands, the same amount of scrub-shrub wetlands, and more emergent and open water wetlands than the Applicant's Proposed Action Alternative.

SEGMENT 4—BROGAN

Segment 4 begins in the Burnt River subbasin and the Northern Rocky Mountains MLRA. This region is characterized mainly by rugged mountains, but has some broad valleys and remnants of high plateaus throughout the B2H Project area (USDA 2016d). Annual precipitation varies by elevation; precipitation amounts are generally low to moderate in the valleys and moderate to high on some of the mountain peaks. This MLRA is wetter than MLRAs within Segment 3. Natural and manmade lakes are common in the area (USDA 2016d). Summers are dry. Most of the precipitation during the fall, winter, and spring is in the form of snow. Surface water is derived primarily from snowmelt runoff, which provides for numerous perennial streams throughout the B2H Project area.

Segment 4 continues into the Willow subbasin and the Snake River Plains MLRA. Some of the major streams have cut deep, steep-walled canyons in the basalt flows and terraces (USDA 2016d). Alluvial fans, terraces, and bottom lands are gently sloping or moderately sloping. Annual precipitation varies by elevation; precipitation amounts are generally low to moderate in the valleys and moderate on some of the higher hills. Most of the precipitation falls as rain in fall, winter, and spring. Snowfall is common during winter. Snowmelt is a chief ingredient for providing surface flows. Little or no precipitation occurs

in summer. This MLRA is wetter than MLRAs within Segment 3, but drier than the Northern Rocky Mountains MLRA to the north.

The Applicant's Proposed Action Alternative and the Willow Creek Alternative begins at Dixie Creek in the Burnt River subbasin and proceeds south between Table Rock and the Burnt River valley. Segment 4 crosses Birch and Durbin Creeks west of Hunting, crosses Willow Creek around Brogan and continues south across Hope Flat and ends near Coyote Springs in the Willow subbasin. The Tub Mountain South Alternative begins with and parallels the Applicant's Proposed Action Alternative until southwest of Huntington. The Tub Mountain South Alternative follows the base of the Slaughterhouse Range and continues south, crossing Pine Tree Ridge, staying east of Tub Mountain and west of Moores Hollow. The Tub Mountain South Alternative crosses Alkali Gulch and the Alkali Flats then bends to the west, crossing Willow Creek and several tributaries to Bully Creek before ending near the Coyote Springs. Streams in this Segment drain to the Burnt and Willow Rivers and, eventually, the Snake River, to the east.

Streams and Impaired Waters

Table 3-75 presents the miles of streams by periodicity and impairment status crossed by crossed by all alternative routes and route variations in Segment 4. The distribution of these stream types in Segment 4 is displayed on MV-6.

Table 3-75. Streams and Impaired Waters Inventory Data for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length	Perennial Streams	Intermittent Streams	Temperature-Impaired Streams (303(d) listed)	Total Miles of Streams Crossed
Applicant's Proposed Action	40.1	1.9	11.4	0.0	13.3
Variation S4-A1	*5.9*	*0.6*	*0.6*	*0.0*	*1.2*
Variation S4-A2	*6.0*	*0.6*	*0.4*	*0.0*	*1.0*
Variation S4-A3	*6.1*	*0.6*	*0.4*	*0.1*	*1.0*
Tub Mountain South	40.5	1.9	8.9	0.0	10.8
Willow Creek	34.6	1.4	9.1	0.0	10.5

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses intermittent and perennial streams and does not cross any 303(d) listed temperature-impaired streams. The Applicant's Proposed Action crosses the most miles of all stream types in Segment 4.

Variations S4-A1 through S4-A3

Variation S4-A1 crosses the same distance of perennial streams as Variations S4-A2 and S4-A3, more intermittent streams than Variations S4-A2 and S4-A3, and does not cross any 303(d) listed temperature-impaired streams.

Tub Mountain South Alternative

The Tub Mountain South Alternative crosses the same amount of perennial streams and less intermittent streams than the Applicant's Proposed Action Alternative. The Tub Mountain South Alternative does not cross any 303(d) listed temperature-impaired streams.

Willow Creek Alternative

The Willow Creek Alternative crosses fewer miles of perennial and intermittent streams than the Applicant's Proposed Action Alternative. The Willow Creek Alternative does not cross any 303(d) listed temperature-impaired streams.

Wetlands

Vegetative associations within the Northern Rocky Mountains MLRA are variable, depending on local precipitation, temperature, elevation, and landform aspect. In the B2H Project area, forested areas on hillslopes are common at higher elevations, with a scare understory of some shrubs and grasses that are shade tolerant (USDA 2016d). In lower elevation areas, forested areas are slightly more expansive than within Segments 2 and 3; however in Segment 4 they are still concentrated around water resources but not as narrowly confined.

Vegetation within the Snake River Plains MLRA tends to be comprised of drier association types, mostly consistent scrub-shrub emergent species throughout the B2H Project area (USDA 2016b). Trees and forested areas are narrowly confined to stream channels and other areas where consistent surficial and reliable groundwater sources are located. Most wetland types within the B2H Project area in the Snake River Plains MLRA are comprised of scrub-shrub and emergent types, reflective of the overall vegetative associations throughout the region.

Table 3-76 presents the wetland types crossed by all alternative routes and route variations in Segment 4. The distribution of these wetland types in Segment 4 is displayed on MV-6.

Table 3-76. Wetland Resources Inventory Data for Segment 4—Brogan Area (miles crossed)

Alternative Route	Total Length	Forested Wetlands	Scrub-Shrub Wetlands	Emergent Wetlands	Open Water	Total Miles of Wetlands Crossed
Applicant's Proposed Action	40.1	0.4	0.1	0.9	5.2	6.6
Variation S4-A1	*5.9*	*0.1*	*0.0*	*0.4*	*0.1*	*0.6*
Variation S4-A2	*6.0*	*0.3*	*0.3*	*0.0*	*0.3*	*0.9*
Variation S4-A3	*6.1*	*0.3*	*0.3*	*0.0*	*0.3*	*0.9*
Tub Mountain South	40.5	1.0	0.9	0.9	5.1	7.9
Willow Creek	34.6	0.4	0.1	0.7	5.5	6.7

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative predominantly crosses open water wetlands, as well as forested, scrub-shrub, and emergent wetlands.

Variations S4-A1 through S4-A3

Variation S4-A1 crosses less forested, scrub-shrub, and open water wetlands and more emergent wetlands than Variations S4-A2 and S4-A3. Variations S4-A2 and S4-A3 cross the same amount of forest wetlands, scrub-shrub wetlands, and open water wetlands.

Tub Mountain South Alternative

The Tub Mountain South Alternative crosses more miles of forested and scrub-shrub wetlands, the same amount of emergent wetlands, and fewer miles of open water wetlands than the Applicant's Proposed Action Alternative.

Willow Creek Alternative

The Willow Creek Alternative crosses the same amount of forested and scrub-shrub wetlands, less emergent wetlands, and more miles of open water wetlands than the Applicant's Proposed Action Alternative.

SEGMENT 5—MALHEUR

Segment 5 begins in the Bully River subbasin near Coyote Springs and proceeds south across Cottonwood Creek and Bully Creek, both headwaters areas to the Bully Creek Reservoir. Segment 5 continues south, crossing into the Lower Malheur subbasin, crossing Lower Malheur Canyon and the Malheur River. In the area of Vine Hill (Link 5-5), the Applicant's Proposed Action Alternative turns east and crosses upper Cow Hollow (Link 5-15), then turns south into the Lower Owyhee subbasin and crosses the Owyhee River near Mitchell Butte (Links 5-40, 5-55 and 5-65). The Applicant's Proposed Action Alternative continues south southeast toward the Segment terminus near Succor River (Link 5-70). Streams in this Segment drain generally toward the Snake River to the east.

Streams and Impaired Waters

Segment 5 begins in the Bully River subbasin and the Snake River Plains MLRA, and continues south into the Lower Malheur subbasin. Some of the major streams have cut deep, steep-walled canyons in the basalt flows and terraces (USDA 2016b). Alluvial fans, terraces, and bottom lands associated with major streams (Malheur and Owyhee rivers) are gently sloping or moderately sloping. Annual precipitation varies by elevation; precipitation amounts are generally low to moderate in the valleys and moderate on some of the higher hills. Most of the precipitation falls as rain in fall, winter, and spring. Snowfall is common during winter. Little or no precipitation occurs in summer (USDA 2016b). This MLRA is wetter than MLRAs within Segment 3, but drier than the Northern Rocky Mountains MLRA within Segment 4.

Segment 5 continues through the Lower Malheur subbasin and the Malheur High Plateau MLRA. The Malheur High Plateau MLRA is characterized as a semi-desert or desert region of plateaus, plains, basins, and many isolated mountain ranges (USDA 2016e). As with other MLRAs, annual precipitation varies by elevation; precipitation amounts are generally low in the valleys and low to moderate on some of the higher elevations. Surface water is generally scarce, except in areas at higher elevations where

precipitation is greater. Streamflow is described within the MLRA as erratic and depends mostly on runoff from melting snow.

Segment 5 travels through the Lower Owyhee subbasin and the Owyhee High Plateau MLRA. The Owyhee High Plateau is a semi-desert region of rolling plateaus, gently sloping basins, plains and several isolated mountains (USDA 2016e). The amount of precipitation is lowest in the valleys and increases with elevation. Rainfall occurs in spring and sporadically in summer. Precipitation occurs mainly as snow in winter. Precipitation is distributed fairly evenly throughout fall, winter, and spring. The amount of precipitation is lowest from midsummer to early autumn. The supply of water from precipitation and streamflow is small and unreliable, except along the Owyhee, Streamflow depends largely on accumulated snow in the mountains.

Table 3-77 presents the miles of streams by periodicity and impairment status crossed by all alternative routes and route variations in Segment 5. The distribution of these stream types in Segment 5 is displayed on MV-6.

Table 3-77. Streams and Impaired Waters Inventory Data for Segment 5—Malheur (miles crossed)

Alternative Route	Total Length	Perennial Streams	Intermittent Streams	Temperature-Impaired Streams (303(d) listed)	Total Miles of Streams Crossed
Applicant's Proposed Action	40.4	1.5	10.7	0.0	12.2
Variation S5-A1	*7.4*	*0.1*	*1.6*	*0.0*	*1.7*
Variation S5-A2	*7.4*	*0.2*	*2.0*	*0.0*	*2.2*
Variation S5-B1	*2.5*	*0.6*	*0.2*	*0.0*	*0.8*
Variation S5-B2	*2.8*	*0.3*	*0.1*	*0.0*	*0.4*
Malheur S	43.5	1.3	11.4	0.1	12.7
Malheur A	43.1	1.3	11.2	0.1	12.5

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses perennial and intermittent streams, and does not cross any 303(d) listed temperature-impaired streams. The Applicant's Proposed Action Alternative crosses the fewest miles of all stream types in Segment 5 compared to the other alternative routes.

Variations S5-A1 and S5-A2

Variation S5-A1 crosses less perennial and intermittent streams than Variation S5-A2. Variations S5-A1 and S5-A2 do not cross any 303(d) listed temperature-impaired streams.

Variations S5-B1 and S5-B2

Variation S5-B1 crosses more perennial and intermittent streams than Variation S5-B2. Variations S5-B1 and S5-B2 do not cross any 303(d) listed temperature-impaired streams.

Malheur S Alternative

The Malheur S Alternative maintains a generally south running route through Sand Hollow and Negro Rock Canyon (Link 5-25). The Malheur S Alternative turns east toward Government Corral Spring and cross into the Lower Owyhee subbasin and the Owyhee River (Link 5-30). The Malheur S Alternative crosses Long Draw and continues into the Middle Snake-Succor subbasin (Link 5-30), crossing several tributaries and headwater areas to the Succor River. The Malheur S Alternative crosses fewer miles of perennial streams and more miles of intermittent and 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative.

Malheur A Alternative

The Malheur A Alternative maintains a generally south running route through Sand Hollow and Negro Rock Canyon (Link 5-25). The Malheur A Alternative turns east toward Government Corral Spring and crosses into the Lower Owyhee subbasin and the Owyhee River (Link 5-35). The Malheur A Alternative crosses Long Draw and continues into the Middle Snake-Succor subbasin (Link 5-35), crossing several tributaries and headwater areas to the Succor River. The Malheur A Alternative crosses less perennial streams and more intermittent and 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative.

Wetlands

Segment 5 consists of a generally drier region than Segment 4. Segment 5 begins near Coyote Springs, crosses several headwater watersheds to the Bully Creek Reservoir and continues south into the Lower Malheur Canyon. The Segment 5 route splits near Vines Hill, with the Applicant's Proposed Action Alternative generally heading east and then south across the upstream end of Cow Hollow. The Applicant's Proposed Action Alternative crosses the Owyhee River near Mitchell Butte (Links 5-50, 5-55 and 5-65), turns back to the west near Black Jack Butte and crosses Alkali Creek (Link 5-70). Both the Malheur A and Malheur S Alternatives cross through Sand Hollow, Negro Rock Canyon and several headwater watersheds to Succor Creek.

Vegetation within the Snake River Plains MLRA tends to be comprised of drier association types, mostly consistent scrub-shrub emergent species throughout the B2H Project area (USDA 2016b). Trees and forested areas are narrowly confined to stream channels and other areas where consistent surficial and reliable groundwater sources are located. Most wetland types within the B2H Project area in the Snake River Plains MLRA are comprised of scrub-shrub and emergent types, reflective of the overall vegetative associations throughout the region.

The Malheur High Plateau MLRA within the Lower Malheur subbasin consists mainly of shrubs with interspersed grasses and scattered trees (USDA 2016e). The generally dry nature and snowmelt dependent water sources confine larger vegetation to perennial streams and groundwater driven wetlands and springs. Topography defines most wetland areas; depressions and other areas of water confinement are generally associated with scrub-shrub and emergent wetland types. Ribbon like vegetative communities are common throughout the Lower Malheur subbasin.

The Owyhee High Plateau MLRA, a semi-desert region, supports a typical shrub-grass association vegetative community (USDA 2016e). Bottomland areas and playa wetlands (rounded lake-type hollows containing wetland features located in the high plains ecoregions) are common throughout. Scrub-shrub wetlands are confined to perennial stream corridors and other areas of consistent water source. Forested wetlands are rare.

Table 3-78 presents wetland types crossed by crossed by all alternative routes and route variations in Segment 5. The distribution of these wetland community types in Segment 5 is displayed on MV-6.

Table 3-78. Wetland Resources Inventory Data for Segment 5—Malheur (miles crossed)

Alternative Route	Total Length	Forested Wetlands	Scrub-Shrub Wetlands	Emergent Wetlands	Open Water	Total Miles of Wetlands Crossed
Applicant's Proposed Action	40.4	0.0	0.1	0.6	3.6	4.3
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.2*	*1.0*	*1.2*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.9*	*0.9*
Variation S5-B1	*2.5*	*0.0*	*0.1*	*0.1*	*0.7*	*0.9*
Variation S5-B2	*2.8*	*0.1*	*0.6*	*0.4*	*0.8*	*1.9*
Malheur S	43.5	0.0	0.2	0.3	4.7	5.2
Malheur A	43.1	0.0	0.0	0.3	4.7	5.0

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative predominantly crosses open water wetlands, as well as scrub-shrub and emergent wetlands.

Variations S5-A1 and S5-A2

Variation S5-A1 crosses more emergent and open water wetlands than Variation S5-A2. Neither variation crosses forested or scrub-shrub wetlands.

Variations S5-B1 and S5-B2

Variation S5-B2 crosses slight more forested, scrub-shrub, emergent and open water wetlands than Variation S5-B1.

Malheur S Alternative

The Malheur S Alternative crosses more scrub-shrub and open water wetlands and less emergent wetlands than the Applicant's Proposed Action Alternative.

Malheur A Alternative

The Malheur A Alternative crosses less emergent wetlands and more open water wetlands than the Applicant's Proposed Action Alternative.

SEGMENT 6—TREASURE VALLEY

Segment 6 begins and ends in the Middle Snake-Succor subbasin. Segment 6 ends in the Middle Snake-Succor subbasin and crosses both the Snake River Plains MLRA and the Owyhee High Plateau MLRAs. The Snake River Plains MLRA in the Middle Snake-Succor subbasin includes major streams, including Sage, Bridge and Jump Creeks, that have cut moderately deep, steep-walled canyons in the basalt flows and terraces (USDA 2016b). Alluvial fans, terraces, and bottom lands associated with major streams are gently sloping or moderately sloping. Annual precipitation varies by elevation; precipitation amounts are generally low to moderate in the valleys and moderate on some of the higher hills. Most of the precipitation falls as rain in fall, winter, and spring. Snowfall is common during winter. Little or no precipitation occurs in summer. This MLRA is slightly wetter than MLRAs within Segment 4, but drier than MLRAs within Segment 5.

The Owyhee High Plateau is a semi-desert region of rolling plateaus, gently sloping basins, plains and several isolated mountains. The amount of precipitation is lowest in the valleys and increases with elevation. Rainfall occurs in spring and sporadically in summer. Precipitation occurs mainly as snow in winter. Precipitation is distributed fairly evenly throughout fall, winter, and spring (USDA 2016e). The amount of precipitation is lowest from midsummer to early autumn. The supply of water from precipitation and streamflow is small and unreliable. Streamflow depends largely on accumulated snow in the mountains. The southern end of the B2H Project in Segment 6 crosses several artificial ditches and streams used for irrigation. Source water for these ditches is from a mix of both local groundwater and snowmelt from surrounding mountains. Influences from local mining and other activities in the region have added to the base sediment loads within the streams and ditches.

Streams and Impaired Waters

Table 3-79 presents the miles of streams by periodicity and impairment status crossed by the alternative routes and route variations in Segment 6. The distribution of these stream types in Segment 6 is displayed on MV-6.

Table 3-79. Streams and Impaired Waters Inventory Data for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length	Perennial Streams	Intermittent Streams	Sediment-Impaired Streams (303(d) listed)	Total Miles of Streams Crossed
Applicant's Proposed Action	28.0	0.7	5.7	0.2	6.4
Variation S6-A1	*9.3*	*0.2*	*2.3*	*0.0*	*2.5*
Variation S6-A2	*8.9*	*0.1*	*2.2*	*0.0*	*2.3*
Variation S6-B1	*14.4*	*0.2*	*3.1*	*0.2*	*3.3*
Variation S6-B2	*14.1*	*0.3*	*3.0*	*0.1*	*3.3*

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses perennial, intermittent, and 303(d) listed sediment-impaired streams.

Variations S6-A1 and S6-A2

Variation S6-A1 crosses more miles of perennial streams and intermittent streams than Variation S6-A2. Variations S6-A1 and S6-A2 do not cross any 303(d) listed sediment-impaired streams.

Variations S6-B1 and S6-B2

Variation S6-B1 crosses fewer miles of perennial streams and more miles of intermittent and 303(d) listed sediment-impaired streams than Variation S6-B2.

Wetlands

The Owyhee High Plateau MLRA, a semi-desert region, supports a typical shrub-grass association vegetative community (USDA 2016e). Bottomland areas and playa wetlands (rounded lake-type hollows containing wetland features located in the high plains ecoregions) are common throughout. Scrub-shrub wetlands are confined to perennial stream corridors and other areas of consistent water source. Forested wetlands are rare.

Table 3-80 presents wetland types crossed by crossed by all alternative routes and route variations in Segment 6. The distribution of these wetland community types in Segment 6 is displayed on MV-6.

Table 3-80. Wetland Resources Inventory Data for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length	Forested Wetlands	Scrub-Shrub Wetlands	Emergent Wetlands	Open Water	Total Miles of Wetlands Crossed
Applicant's Proposed Action	28.0	0.2	0.3	0.4	2.3	3.2
Variation S6-A1	*9.3*	*0.0*	*0.2*	*0.3*	*1.2*	*1.7*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.3*	*0.4*	*0.7*
Variation S6-B1	*14.4*	*0.2*	*0.1*	*0.1*	*0.3*	*0.7*
Variation S6-B2	*14.1*	*0.2*	*0.0*	*0.1*	*0.3*	*0.6*

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative predominantly crosses open water wetlands. The Applicant's Proposed Action Alternative also crosses forested, scrub-shrub and emergent wetlands.

Variations S6-A1 and S6-A2

Variation S6-A1 crosses the same amount of emergent wetlands and more scrub-shrub and open water wetlands than Variation S6-A2.

Variation S6-B1 and S6-B2

Variation S6-B1 crosses the same amount of forested, emergent, and open water wetlands as Variation S6-B2. In addition, Variation S6-B1 crosses scrub-shrub wetlands.

3.2.2.6 Environmental Consequences (Results of Analysis)

Types of Potential Effects

The method developed for assessing potential impacts on water resources associated with the B2H Project was developed by the BLM in coordination with the cooperating agencies, including the following:

- Identifying particular sensitivity, abundance, and value of inventoried water resources
- Identifying types of potential effects on water resources that could result from construction, operation, and maintenance of the B2H Project
- Developing criteria for assessing the level of potential effects on water resources
- Determining initial impacts on water resources
- Identifying appropriate design features of the B2H Project for environmental protection (Table 2-7) to avoid or minimize potential adverse effects on water resources
- Determining where selective mitigation measures (Table 2-13) should be applied and disclosing residual impacts on water resources

Direct Effects

Construction, operation, and maintenance of the B2H Project could result in direct effects on water quality. Construction of permanent and temporary access roads would require crossing water resources where use of existing facilities is not feasible. Road construction or improvement could require temporary removal of wetland vegetation; grading of banks; and/or the placement of fill, such as washed rock, native substrate, bridge pilings, culverts, wing walls, etc., to support a bridge or other stream-crossing structures. Modification of water resources (i.e., removal of wetland vegetation, dredging of bed materials, temporary diversions, or impoundments) could be required for B2H Project construction, operation, or maintenance. Any such activity would be avoided unless constructability standards preclude such avoidance.

Direct impacts on perennial and intermittent streams could occur with the construction of such features as hardened stream crossings (culverts, larger bridge structures that require piers or footings) or other B2H Project associated structures that may be located below the ordinary high-water mark. Implementation of stream crossings may reduce flood capacity and create backwater conditions upstream of the structures during high precipitation events. Structures also may create turbid conditions around the area of impact and create erosional features, increasing turbidity during flood events.

Direct impacts on 303(d) listed temperature-impaired streams would be limited to removal of streamside vegetation, reduction of the availability of shading resources, point-source addition of surface-water runoff and reduction of volume of water within streams from upstream backwater flooding conditions created from stream-channel alterations due to construction of hardened stream crossings.

B2H Project facilities crossing or located near water resources would be constructed within the minimum footprint required to safely and effectively conduct construction activities while maintaining water conveyance and the stability of wetland areas, streambeds, and stream banks. Improving existing roads and water crossings would require the application of stabilization measures to maintain B2H Project conformance with state and federal water-quality standards not currently implemented or required along existing roads.

Indirect Effects

In areas where B2H Project facilities could not avoid water resources completely, short-term indirect effects also could occur. Indirect effects may include an increased potential for erosion-caused sedimentation to be discharged into a waterbody from destabilization of soils, removal of vegetation, or modification of stream geomorphology. Following implementation of design features of the B2H Project for environmental protection and selective mitigation measures, short-term indirect effects on water resources would be mitigated or reduced to minor levels. Long-term indirect effects are not likely to occur following stabilization and reclamation of areas disturbed by construction activities.

The CWA requires that any work performed in the bed and banks and below the plane of the ordinary high-water mark (i.e., direct effects) in water(s) of the U.S. (including wetlands [33 CFR 328.3]) would require USACE authorization under 33 CFR 404. Dredging or filling any water(s) of the U.S. requires mitigation of impacts, which can range from preconstruction avoidance and minimization during the design phase to mitigation for the permanent loss of water(s) of the U.S. Mitigation requirements for potential B2H Project impacts on water(s) of the U.S. are addressed through design features of the B2H Project for environmental protection, which specify that impacts on water resources are to be avoided or minimized to the extent practicable. Unavoidable impacts over an allowable threshold specified by the CWA permits required for the B2H Project would be offset by additional required mitigation.

Additional indirect effects could occur due to ground-disturbing activities, such as clearing, grubbing, and blading to remove vegetation for safe workspaces. These activities would mobilize fugitive dust and destabilize soils in some places. Mobilization of fugitive dust and erosion may result in the discharge of sediment to water resources. Increased sedimentation indirectly related to ground-disturbing activities potentially could degrade the functional capacity of water resources, including wetland areas, by discharging higher rates of sediment into the system than can be attenuated, filtered, and/or immobilized under normal circumstances. These effects would only occur where unexpected circumstances, such as dramatic or non-typical climactic events, compromise the integrity and functionality of erosion-control design features or where design features are not properly installed and maintained.

Other indirect effects on water resources could include accidental spills of environmentally harmful substances, such as petroleum products, concrete waste, herbicides, or incidental stabilization of native materials. Indirect effects on springs would be similar to those described for perennial wetlands, streams, and ponds, and impacts on wells could include accidental physical damage to well structures

during construction. Another potential indirect effect could include the accidental introduction of aquatic invasive species. Following implementation of design features of the B2H Project for environmental protection and implementation of selective mitigation measures, potential indirect effects on water resources could be mitigated completely.

Effects Common to All Water Resources

Low and moderate residual impacts could occur as a result of construction of temporary and permanent B2H Project facilities associated with all alternative routes in proximity to water resources. Project facilities would be sited away from the banks of any major waterway. Removal of vegetation from the uplands and possibly from the wetland areas on the periphery of perennial streams and rivers, as well as soil compaction and decompaction from construction, operation, and maintenance, would result in greater potential for erosion and sedimentation into perennial streams and rivers or their tributaries. It is expected that through implementation of design features of the B2H Project for environmental protection and selective mitigation measures, residual impacts on most water resources would be reduced to low levels. However, forested wetlands could be subject to moderate residual impacts.

Effects Specific to Each Water Resource

Streams and Crossings

Potential impacts on surface water from stream crossings during B2H Project operations include erosion of streambanks and sedimentation of road runoff from stormwater. Culverts may be blocked by debris in streams and cause water to back up and flood areas. Use of roads during maintenance activities may promote erosion.

Where possible, existing access routes would be used to avoid disturbance to streams and waterbodies, such as perennial and intermittent streams. If constructing a new stream crossing is impractical or requires a very large (greater than 48 inches in diameter) culvert, upgrading local existing stream crossings would be prioritized to avoid construction of a new access route or a new crossing.

The construction of drive-through fords and the installation of culverts and bridges would require in-stream work that potentially could cause short-term increases in erosion and sedimentation in the waterbody at the construction site, with sedimentation effects extending downstream. Fords would not have long-term effects on water flows or quality. Bridges will be placed above and outside of the ordinary high-water line, which would keep all work out of the waterbody. Other potential impacts from culverts include channel scouring, changes in channel geometry and gradient, and aggradation or degradation of the stream channel.

During the construction period (i.e., when the road is used to transport equipment to and from construction sites), temporary crossing structures (including temporary bridges, temporary culverts) and temporary fords would be used at all stream crossings with flow to reduce potential adverse short-term impacts on water quality. Long-term impacts would be eliminated since the temporary crossing structures would be removed after construction, and affected areas, including fords, would be reclaimed.

Culverts would be designed and installed under the guidance of a qualified engineer who would recommend placement locations, culvert sizing, and proper construction methods on a site-specific basis to minimize potential impacts. Construction may occur during periods of low water or normal flow. The use of equipment in streams would be minimized. Culvert slope would not exceed stream gradient. Sandbags or other non-erosive material would be placed around the mouth of culverts to prevent scour or water flow around the culvert. Adjacent sediment-control structures, such as silt fences, check dams, rock armoring, or riprap, may be necessary to prevent erosion or sedimentation. Streambanks and approaches may be stabilized with rock or other erosion-control devices.

The Applicant would construct culverts under a Construction Stormwater General Permit (1200-C) in Oregon and a Construction General Permit, which is required for stormwater management operations in Idaho. These permits require development of BMPs to protect streams from stormwater runoff. BMPs also would be employed to minimize sedimentation to waterbodies from construction activities.

All streambed disturbances would be permitted under the terms of a USACE CWA Section 404 authorization, which governs activities within any water(s) of the U.S. In Idaho and Oregon, additional requirements would be met for the permitting of cut or fill in wetlands and waters (Oregon) and for the permitting of stream-channel alteration activities in streambeds (Idaho). In-stream work also would be conducted during ODFW-designated in-stream work windows, which vary based on fish species present within or supported by each waterbody.

303(d) Listed Impaired Waters

Of the 100 sediment-impaired waters and 140 temperature-impaired waters inventoried in the study corridor, 55 have an EPA-approved TMDL limitation designated for the source or sources of impairment (EPA 2016c). If the B2H Project, for any reason, causes the discharge of materials to these waters and contributes to the maximum-allowable TMDL, such as the discharge of sediment from erosion, fugitive dust, or incidental fallback to an impaired water listed for sediment or total dissolved solids, the B2H Project would be in violation of that TMDL and Sections 319, 401, and 402 of the CWA. The construction of access roads and stream crossings could result in localized effects on TMDL and 303(d) listed sediment-impaired streams from soil disturbance during construction.

Crossings of temperature-listed streams at points that currently do not contain forested vegetation (which serves as summer stream shade) would not have a measurable impact on average stream temperatures. However, tree removal would be necessary in forested wetland areas to provide clearance for energized lines or access roads, and this could contribute to local increases in stream temperatures if substantial amounts of vegetation are cleared, reducing shaded stream cover (Danehy et al. 2005). Additional erosion- and sediment-control measures to minimize impacts on surface water would be contained in the SWPPP and would apply to construction near TMDL and 303(d) listed streams.

Vegetation Removal

Loss of wetland vegetation resulting from construction activities can reduce stream summer shading, large woody debris input, and terrestrial organic input and can increase bank instability, average water

temperatures, and erosion potential. In areas where the roots of wetland vegetation are the primary bank-stabilizing force, loss of wetland vegetation can result in stream migration. In addition, soil disturbances can increase soil erosion (or water runoff in areas with compacted soils) and result in an increase in suspended sediments within adjacent waterbodies (Naiman and Bilby 1998). Because of the extent of direct disturbances to banks and wetland vegetation, these impacts will be greatest where roads cross waterbodies.

Removal of vegetation and direct solar radiance can result in higher local temperature increases (Danehy et al. 2005). As stream temperature constantly is adjusting toward equilibrium with air temperature, influences of direct solar radiance can be substantial. However, even though gaps in canopy cover can result in an immediate increase in stream temperature, as canopy cover resumes downstream, stream temperatures do not continue to increase at an accelerated rate (Danehy et al. 2005).

In areas where the transmission line crosses forested wetlands, tree heights will need to be kept below the transmission line for safety and maintenance reasons. Vegetation removal associated with crossings in forested settings is expected to be minimal and localized, without an overall increase in stream temperatures. Minimal research has been conducted regarding the effects of wetland vegetation removal on stream temperatures in shrub land ecosystems. Other factors being constant, stream temperatures in shrub land systems can be expected to generally be higher than those of forested systems, due to a lack of canopy cover (Danehy et al. 2005). Furthermore, existing shrub land canopy cover likely has a limited effect on stream temperatures because of its minimal shade contribution. Shrub canopy cover typically is concentrated along the edges of a stream. Overhead sun imparts maximum solar radiance directly onto the deeper, middle portions of the stream. Because of the limited shading provided by the existing shrub land vegetation, changes in stream temperature related to wetland vegetation removal are likely to be immeasurable (Danehy et al. 2005).

Wetlands

Construction would result in short-term and long-term impacts on wetlands. Short-term impacts are the impacts on those wetlands that would be restored and would return to full function following construction. The restoration of these wetlands and their return to full function depends on the type of associated vegetative community composing the wetland habitat. These impacts are considered short term because wetland functions would decrease on a short-term basis but would be restored.

The short-term impacts on wetlands primarily would be caused by the removal of vegetation and associated soil disturbance but would not result in a loss of wetland acreage. The effects of short-term impacts caused by clearing may persist beyond the construction phase and, therefore, be long-term but not permanent. Vegetation recovery in wetlands would vary depending on the type of vegetation removed. Emergent wetlands would recover the most quickly and could become revegetated within 1 or 2 years of initial disturbance (Sheldon et al. 2005). Scrub-shrub wetlands, however, may take up to 10 years to recover (Kentula 2004). Forested wetland vegetation recovery could take decades and is dependent on several factors, such as the tree species affected, seral stage of the affected forest, hydrologic regime, and elevation.

The direct effect of removing vegetation and disturbing the soil could alter various functions provided by wetlands, resulting in a variety of indirect and secondary effects, such as the provision of wildlife habitat and the ability to trap sediment and nutrients. Soil disturbances and the removal of vegetation within a wetland temporarily could alter the area's ability to moderate flood flow, control sediments, or facilitate surface-water flow (Sheldon et al. 2005). The removal of vegetation could increase water and soil temperatures locally and alter the vegetative composition in these areas.

Increased soil disturbances can lead to invasions by exotic plant species, which can alter the composition and function of wetlands (Sheldon et al. 2005). Any blasting that may occur within or adjacent to a wetland could fracture the bedrock and alter the hydrology of a perched water table, potentially leading to an altered hydrologic regime (drier conditions) and impairing revegetation efforts. Soil compaction and reduced infiltration rates also may be effects from blasting activities. Failure to restore disturbed areas to preconstruction conditions (contours, hydrology, and the restoration of topsoil) could impede the re-establishment of wetland vegetation. Vegetation in scrub-shrub and emergent wetlands is low growing and does not interfere with transmission lines; therefore, these wetland types would not be affected by maintenance during the operations phase.

The construction of the B2H Project could result in wetland fill for the duration of the B2H Project, due to the footprint of operational facilities. Both long-term and short-term impacts would be included in the Section 404 permit for the B2H Project. An additional long-term wetland impact is the conversion of forested wetlands to other wetland types. This would occur during the maintenance of tree heights below the transmission line, resulting in a vegetative community conversion from forested wetlands to scrub-shrub wetlands. The final B2H Project design would avoid these areas to the maximum extent practical; however, impacts may result from soil compaction, the alteration of surface or subsurface water movement in wetlands, or blasting effects near springs and seeps.

Impacts on wetland resources will be minimized following preconstruction surveys to definitively locate wetland boundaries and confirm habitat types and hydrologic connectivity with adjacent habitat types. Additional minimization strategies may be employed, including micro-siting of B2H Project facilities to affect emergent wetlands in lieu of forested wetlands, thereby minimizing the temporal and habitat class impacts on important forested wetland areas within the study corridor.

Groundwater

The potential for the B2H Project to affect groundwater as a result of contamination, consumptive use, or altered infiltration rates were issues identified for additional analysis in comments on the Draft EIS.

The risk for groundwater contamination exists where geotechnical boreholes or excavations for structural foundations encounter groundwater. A geotechnical investigation, conducted as one of the initial phases of construction, would be used to characterize the geologic composition of areas where B2H Project facilities are proposed and identify areas of shallow groundwater. Temporary piezometers may be installed in areas where high groundwater is encountered and information collected would be used to better understand seasonal groundwater fluctuations and inform structure design considerations.

A potential impact on groundwater resources would occur from construction dewatering. The Applicant has committed to using, for the construction of the B2H Project, water that would be procured from existing municipal sources, from commercial sources, or under a temporary water-use agreement with landowners holding existing water rights. No new water rights or water wells would be required. Therefore, water necessary for the construction of the B2H Project is not anticipated to affect existing groundwater levels.

Adverse impacts on groundwater quality would be avoided through the use of spill prevention measures, as established in the SPCC Plan. These spill prevention measures would help avoid an accidental chemical spill near an open excavation. Materials such as fuels and other petroleum products; chemicals; and hazardous materials, including wastes, would be located in upland areas away from streams or wells. The Applicant also has proposed to compensate any well owner for damage to the well or provide an acceptable alternative water source.

Section 3.2.1 provides a detailed analysis of potential B2H Project effects on earth resources. Compaction and water ponding are soil disturbances that result in the loss of soil structure, possibly leading to a decrease in water infiltration rates and groundwater recharge. Compaction of soils would be mitigated where access roads are temporary but could remain on permanent access roads and at towers. The Water Resources Protection Plan, to be developed for the POD, will contain standard measures that would be implemented for avoiding potential adverse effects on groundwater as a result of soil disturbance. A Reclamation, Revegetation, and Monitoring Framework Plan identifying reclamation stipulations designed to alleviate soil compaction and ponding also would be developed and incorporated into the POD. Overall, soil compaction and water ponding would be minimized by the design features of the B2H Project for environmental protection and resource protection plans. Water infiltration and groundwater recharge is at a landscape scale and the area affected by the B2H Project would be limited to the area of construction and would result in negligible changes in infiltration rates and effects on groundwater resources.

Groundwater Drinking Water Source Areas

The Applicant will comply with applicable regulations for managing surface disturbances and land uses and materials in groundwater DSWAs. Idaho (IDAPA 39-3600 et seq.) and Oregon (ORS 448.131) state statutes for drinking water protection and standards for abandoning drill holes would be adhered to wherever groundwater is encountered (Design Feature 14). Spill prevention and containment measures would be incorporated as needed (Design Feature 21). The Water Resources Protection Plan (Design Feature 1), to be developed for the POD, will contain standard measures that would be implemented for avoiding potential adverse effects on groundwater resources. These design features and protection plans are anticipated to sufficiently protect groundwater resources; therefore, impacts on groundwater resources as the result of contamination are not further assessed in this EIS.

Water Wells

B2H Project construction has the potential to cause adverse impacts on groundwater wells in areas of shallow bedrock as a result of blasting. Uncased groundwater wells would be the most vulnerable to disturbance from blasting. Many groundwater wells in southern Idaho are constructed as “open holes,”

meaning they are not cased along their entire interval. If nearby blasting causes the dislodging of a rock from the boring sidewall, the rock could fall down the well and trap the submersible pump. This circumstance could result in damage to the well. The effects of well damage could be loss of a potable water supply or loss of irrigation water flow to farmland.

Typically, contact with construction equipment would not affect groundwater quality except to increase turbidity temporarily in a limited area because most of the B2H Project's support structures (towers, H-frames, and monopole tangent and dead-end structures) would be 15 feet or less. Heavy dead-end, H-frame structures, if used, would require the deepest (40-foot) foundations and would have a greater likelihood of contacting shallow groundwater. The B2H Project temporarily could affect groundwater quality in localized drinking water wells to a limited extent from excess sediment influx into groundwater wells located near B2H Project excavations.

Floodplains

Placement of B2H Project facilities or structures into designated floodplains could result in flooding of or erosional damage to the encroaching structure, diversion of flows and increased flood risk for adjacent or upstream property, or increased erosion on adjacent or upstream property. During operations, right-of-way repairs would include spot repair of sites subject to flooding or scouring to prevent damage to both B2H Project structures and nearby property.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the environment would remain as it presently exists and no identifiable impacts are expected on any water resource.

SEGMENT 1—MORROW-UMATILLA

Streams and Impaired Waters

Table 3-81 summarizes the total miles crossed and residual impacts on streams for all alternative routes and variations in Segment 1. Impacts on impaired waters are not anticipated as impaired waters are not crossed in Segment 1.

Table 3-81. Streams Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Perennial Streams (miles)			Intermittent Streams (miles)			Total Miles of Streams Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Low	None		Low	None	
Applicant's Proposed Action	91.9	1.4	1.4	90.5	19.8	19.8	72.1	21.2
Variation S1-B1	*6.4*	*0.2*	*0.2*	*6.2*	*1.8*	*1.8*	*4.6*	*2.0*
Variation S1-B2	*6.4*	*0.4*	*0.4*	*6.0*	*1.8*	*1.8*	*4.6*	*2.2*
East of Bombing Range Road	92.3	1.4	1.4	90.9	19.5	19.5	72.8	20.9
Applicant's Proposed Action – Southern Route	99.1	1.7	1.7	97.4	20.5	20.5	78.6	22.2

Table 3-81. Streams Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Perennial Streams (miles)			Intermittent Streams (miles)			Total Miles of Streams Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Low	None		Low	None	
West of Bombing Range Road – Southern Route	95.6	2.4	2.4	93.2	16.6	16.6	79.0	19.0
Longhorn	88.2	1.5	1.5	86.7	17.4	17.4	70.8	18.9
Interstate 84	84.7	1.7	1.7	83.0	13.1	13.1	71.6	14.8
Variation S1-A1	*18.5*	*0.2*	*0.2*	*18.3*	*3.0*	*3.0*	*15.5*	*3.2*
Variation S1-A2	*18.5*	*0.2*	*0.2*	*18.3*	*3.8*	*3.8*	*14.7*	*4.0*
Interstate 84 – Southern Route	93.4	2.0	2.0	91.4	14.4	14.4	79.0	16.4

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in low residual impacts on both perennial and intermittent streams.

Direct and indirect effects on streams could include temporary increases in erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative. The types of potential effects on streams are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning water resources within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, preventing the introduction of sediment to streams, and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the creation of new stream crossings and access roads, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on streams. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in stream temperature from the indirect effects of vegetation removal near streams and headwater areas. Low residual impacts also could result from increases in sediment due to removal of streamside vegetation, bank destabilization from erosional conditions created by stream-channel alteration or heavy precipitation events carrying disturbed upslope soils from roadways or construction areas into streams. Table 3-81 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on streams.

Variations S1-B1 and S1-B2

Variations S1-B1 and S1-B2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S1-B1 would result in less residual impacts on perennial streams and the same amount of residual impacts on intermittent streams than Variation S1-B2 as a less perennial

streams and the same amount of intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 of the additional action do not cross any streams and would not result in any direct, indirect, or residual impacts on streams.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be similar on perennial streams and less on intermittent streams than the Applicant's Proposed Action Alternative as the same amount of perennial streams and less intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be greater on perennial and intermittent streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams and intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2 and 3

Design Options 1, 2, and 3 of the additional action do not cross any streams and would not result in any direct, indirect, or residual impacts on streams.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be greater on perennial streams and less on intermittent streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams and less intermittent streams are crossed. This alternative route is anticipated to have the greatest amount of residual impacts on perennial streams than any other alternative route in Segment 1. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2 and 3

Design Options 1, 2, and 3 of the additional action do not cross any streams and would not result in any direct, indirect, or residual impacts on streams.

Longhorn Alternative

The Longhorn Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be greater on perennial streams and less on intermittent streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams and less intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative and Variations

The Interstate 84 Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be greater on perennial streams and less on intermittent streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams and less intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S1-A1 and S1-A2

Variations S1-A1 and S1-A2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S1-A1 would result in the same amount of residual impacts on perennial streams and a lesser amount of residual impacts on intermittent streams than Variation S1-A2 as the same amount of perennial streams and less intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams would be similar to those described for the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be greater on perennial streams and less on intermittent streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams and less intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Wetlands

The estimates of impacts on wetlands are based on the preliminary location of the B2H Project centerline. As a result, the impacts that would actually occur from construction and operations are overestimated as B2H Project components (including towers, roads, equipment storage yards, fly yards, and laydown areas) would be sited outside of wetland areas whenever possible (as is a standard engineering practice). Avoidance of wetlands and implementing design features listed in Table 2-7 would further reduce impacts on wetlands. Table 3-82 summarizes the total miles crossed and residual impacts on wetlands for all alternative routes and route variation in Segment 1.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent, and open water wetlands. Direct and indirect effects on wetlands could include temporary impacts on vegetation from construction, temporary increases in erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action, and temporary impacts from clearing of vegetation, including loss of shading and reduction or loss of flood water attenuation availability. The types of potential effects on wetlands are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning wetlands within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, limiting or avoiding vegetation clearing, and limiting the removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the spatial and temporal extent of impacts on wetland vegetation, limit the creation of new wetland and access road crossings, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on wetlands. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Moderate residual impacts could result from effects on forested wetlands, including complete removal of individual trees or portions of tree stands or construction activities affecting tree health (including soil compaction in near tree roots, soil disturbance near tree roots or trimming of branches).

Low residual impacts could result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the B2H Project in proximity to wetlands. Table 3-82 summarizes the expected level of initial impacts, applied selective mitigation measures, and resulting residual impacts on wetlands.

Variations S1-B1 and S1-B2

Variations S1-B1 and S1-B2 are anticipated to result in low residual impacts on wetlands. Variation S1-B1 only crosses a small emergent wetland while Variation S1-B2 only crosses open water wetlands. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1, 2 and 3

Design Option 1, 2, and 3 of the additional action not cross any mapped wetlands and would not result in any direct, indirect, or residual impacts on wetlands.

Table 3-82. Wetlands Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Forested Wetlands (miles)			Scrub-Shrub Wetlands (miles)			Emergent Wetlands (miles)			Open Water (miles)			Total Miles of Wetlands Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Moderate	None		Low	None		Low	None		Low	None	
Applicant's Proposed Action	91.9	0.3	0.3	91.6	0.5	0.5	91.4	2.0	2.0	89.9	2.3	2.3	89.6	5.1
Variation S1-B1	*6.4*	*0.0*	*0.0*	*6.4*	*0.0*	*0.0*	*6.4*	*0.1*	*0.1*	*6.3*	*0.0*	*0.0*	*6.4*	*0.1*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*6.4*	*0.0*	*0.0*	*6.4*	*0.0*	*0.0*	*6.4*	*0.4*	*0.4*	*6.0*	*0.4*
East of Bombing Range Road	92.3	0.3	0.3	92.0	0.5	0.5	91.8	2.1	2.1	90.2	2.1	2.1	90.2	5.0
Applicant's Proposed Action – Southern Route	99.1	0.7	0.7	98.4	0.7	0.7	98.4	2.0	2.0	97.1	4.0	4.0	95.1	7.4
West of Bombing Range Road – Southern Route	95.6	0.9	0.9	94.7	0.8	0.8	94.8	2.5	2.5	93.1	3.8	3.8	91.8	8.0
Longhorn	88.2	0.1	0.1	88.1	0.5	0.5	87.7	2.5	2.5	85.7	1.9	1.9	86.3	5.0
Interstate 84	84.7	0.1	0.1	84.6	0.8	0.8	83.9	2.9	2.9	81.8	4.8	4.8	79.9	8.6
Variation S1-A1	*18.5*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*	*18.5*	*0.6*	*0.6*	*17.9*	*0.6*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*18.5*	*0.1*	*0.1*	*18.4*	*0.1*	*0.1*	*18.4*	*0.9*	*0.9*	*17.6*	*1.1*
Interstate 84 – Southern Route	93.4	0.5	0.5	92.9	1.0	1.0	92.4	2.9	2.9	90.5	6.4	6.4	87.0	10.8

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative is anticipated to result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent, and open water wetlands. The East of Bombing Range Road Alternative would result in greater residual impacts on emergent wetlands as compared to the Applicant's Proposed Action Alternative as greater amounts of emergent wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative is anticipated to result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent, and open water wetlands. The Applicant's Proposed Action – Southern Route Alternative would result in greater residual impacts on forested, scrub-shrub, and open water wetlands as compared to the Applicant's Proposed Action Alternative as greater amounts of these wetland types are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1, 2 and 3

Design Option 1, 2, and 3 of the additional action not cross any mapped wetlands and would not result in any direct, indirect, or residual impacts on wetlands.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road– Southern Route Alternative is anticipated to result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent, and open water wetlands. The West of Bombing Range Road– Southern Route Alternative would result in greater residual impacts on all wetland types as compared to the Applicant's Proposed Action Alternative as greater amounts of all wetland types are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1, 2 and 3

Design Option 1, 2, and 3 of the additional action not cross any mapped wetland types and would not result in any direct, indirect, or residual impacts on wetlands.

Longhorn Alternative

The Longhorn Alternative is anticipated to result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent, and open water wetlands. The Longhorn Alternative would result in greater residual impacts on emergent wetlands as compared to the Applicant's

Proposed Action Alternative as greater amounts of emergent wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative and Variations

The Interstate 84 Alternative is anticipated to result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent, and open water wetlands. The Interstate 84 Alternative would result in greater residual impacts on scrub-shrub, emergent, and open water wetlands as compared to the Applicant's Proposed Action Alternative as greater amounts of these wetlands types are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S1-A1 and S1-A2

Variation S1-A1 would have low residual impacts on open water wetlands. Variation S1-A2 would have low residual impacts on emergent, scrub-shrub, and open water wetlands. Variation S1-A1 would result in less residual impacts on open water wetlands than Variation S1-A2 as less open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative is anticipated to result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent, and open water wetlands. The Interstate 84 – Southern Route Alternative would result in greater residual impacts on all wetland types as compared to the Applicant's Proposed Action Alternative as greater amounts of all wetlands types are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Conclusions

All alternative routes in Segment 1 would result in low residual impacts on perennial and intermittent streams. The Interstate 84 Alternative crosses the least amount of perennial and intermittent streams, and would therefore result in the least amount residual impacts on streams in Segment 1.

All alternative routes in Segment 1 would result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Longhorn and East of Bombing Range Road Alternatives cross the least amount of wetlands; however, the Longhorn Alternative crosses less forested wetlands than the East of Bombing Range Road Alternative.

SEGMENT 2—BLUE MOUNTAINS

Streams and impaired waters

Table 3-83 presents the total miles crossed and residual impacts on streams and impaired waters for all alternative routes and route variations in Segment 2.

Table 3-83. Streams and Impaired Waters Inventory Data and Residual Impacts for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Perennial Streams (miles)			Intermittent Streams (miles)			303(d) Listed/ Temperature-Impaired Waters			Total Miles of Streams Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Low	None		Low	None		Low	None	
Applicant's Proposed Action	33.8	2.2	2.2	31.6	5.6	5.6	28.2	0.2	0.2	33.6	7.8
Variation S2-A1	*2.8*	*0.0*	*0.0*	*2.8*	*0.7*	*0.7*	*2.1*	*0.0*	*0.0*	*2.8*	*0.7*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*2.9*	*1.4*	*1.4*	*1.5*	*0.0*	*0.0*	*2.9*	*1.4*
Variation S2-B1	*3.7*	*0.8*	*0.8*	*2.9*	*0.7*	*0.7*	*3.0*	*0.0*	*0.0*	*3.7*	*1.5*
Variation S2-B2	*3.8*	*0.7*	*0.7*	*3.1*	*0.8*	*0.8*	*3.0*	*0.0*	*0.0*	*3.8*	*1.5*
Variation S2-C1	*9.3*	*0.3*	*0.3*	*9.0*	*0.7*	*0.7*	*8.6*	*0.0*	*0.0*	*9.3*	*1.0*
Variation S2-C2	*8.8*	*0.6*	*0.6*	*8.2*	*0.5*	*0.5*	*8.3*	*0.0*	*0.0*	*8.8*	*1.1*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*2.3*	*0.3*	*0.3*	*2.0*	*0.0*	*0.0*	*2.3*	*0.3*
Variation S2-E2	*2.6*	*0.1*	*0.1*	*2.5*	*0.2*	*0.2*	*2.4*	*0.0*	*0.0*	*2.6*	*0.3*
Variation S2-F1	*12.1*	*0.7*	*0.7*	*11.4*	*2.1*	*2.1*	*10.0*	*0.2*	*0.2*	*11.9*	*2.8*
Variation S2-F2	*12.2*	*1.1*	*1.1*	*11.1*	*1.6*	*1.6*	*10.6*	*0.2*	*0.2*	*12.0*	*2.7*
Glass Hill	33.7	2.6	2.6	31.0	5.5	5.5	28.1	0.2	0.2	33.4	8.1
Variation S2-D1	*4.3*	*0.6*	*0.6*	*3.7*	*0.7*	*0.7*	*3.6*	*0.0*	*0.0*	*4.3*	*1.3*
Variation S2-D2	*4.1*	*0.7*	*0.7*	*3.4*	*0.2*	*0.2*	*3.9*	*0.0*	*0.0*	*4.1*	*0.9*
Mill Creek	34.0	2.4	2.4	31.6	5.4	5.4	28.6	0.2	0.2	33.8	7.8

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative and Variations

The Applicant's Proposed Action Alternative would result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams.

Direct and indirect effects on streams could include temporary increases in erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action. The types of potential effects on streams are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning water resources within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, preventing the introduction of sediment to streams, and limiting removal of streamside vegetation. The application of several

selective mitigation measures aimed to reduce the creation of new stream crossings and access roads, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on streams. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in stream temperature from the indirect effects of vegetation removal near streams and headwater areas. Low residual impacts also could result from increases in sediment due to removal of streamside vegetation, bank destabilization from erosional conditions created by stream-channel alteration or heavy precipitation events carrying disturbed upslope soils from roadways or construction areas into streams. Table 3-83 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on streams.

Variations S2-A1 and S2-A2

Variations S2-A1 and S2-A2 are anticipated to result in low residual impacts on intermittent streams. Variation S2-A1 would result in less residual impacts on intermittent streams than Variation S2-A2 as less intermittent streams are crossed. Direct and indirect effects on intermittent streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative. No residual impacts on perennial or 303(d) temperature-impaired streams are anticipated as these stream types are not crossed by these variations.

Variations S2-B1 and S2-B2

Variations S2-B1 and S2-B2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S2-B1 would result in a greater amount of residual impacts on perennial streams and less residual impacts on intermittent streams than Variation S2-B2 as a greater amount of perennial streams and less intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative. No residual impacts on 303(d) temperature-impaired streams are anticipated as this stream type is not crossed by these variations.

Variations S2-C1 and S2-C2

Variations S2-C1 and S2-C2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S2-C1 would result in less residual impacts on perennial streams and a greater amount of residual impacts on intermittent streams than Variation S2-C2 as less perennial streams and a greater amount of intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative. No residual impacts on 303(d) temperature-impaired streams are anticipated as this stream type is not crossed by these variations.

Variations S2-E1 and S2-E2

Variations S2-E1 and S2-E2 are anticipated to result in low residual impacts on intermittent streams and Variation S2-E2 is anticipated to result in low residual impacts on perennial streams. Variation S2-E1 would result in a greater amount of residual impacts on perennial streams than Variation S2-E2 as a greater amount of perennial streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative. No residual impacts on 303(d) temperature-impaired streams are anticipated as this stream type is not crossed by these variations.

Variations S2-F1 and S2-F2

Variations S2-F1 and S2-F2 are anticipated to result in low residual impacts on perennial, intermittent, and 303(d) temperature-impaired streams. Variation S2-F1 would result in less residual impacts on perennial streams, a greater amount of residual impacts on intermittent streams, and the same amount of residual impacts on 303(d) temperature-impaired streams than Variation S2-F2 as less perennial streams, a greater amount of intermittent streams, and the same amount of 303(d) temperature-impaired streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Glass Hill Alternative and Variations

The Glass Hill Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) temperature-impaired streams. Residual impacts would be greater on perennial streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

Variations S2-D1 and S2-D2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S2-D1 would result in less residual impacts on perennial streams and a greater amount of residual impacts on intermittent streams than Variation S2-D2 as less perennial streams and a greater amount of intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams would be similar to those described for the Applicant's Proposed Action Alternative.

Mill Creek Alternative

The Mill Creek Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) temperature-impaired streams. Residual impacts would be greater on perennial streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation

measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Wetlands

The estimates of impacts on wetlands are based on the preliminary location of the B2H Project centerline. As a result, the impacts that would actually occur from construction and operations are overestimated as B2H Project components (including towers, roads, equipment storage yards, fly yards, and laydown areas) would be sited outside of wetland areas whenever possible (as is a standard engineering practice). Avoidance of wetlands and implementing design features listed in Table 2-7 would further reduce impacts on wetlands.

Table 3-84 presents the total miles crossed and residual impacts on wetlands for all alternative routes and route variations in Segment 2.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in low residual impacts on scrub-shrub, emergent, and open water wetlands. Direct and indirect effects on wetlands could include temporary impacts on vegetation from construction, temporary increases in erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative, and temporary impacts from clearing of vegetation, including loss of shading and reduction or loss of flood water attenuation availability. The types of potential effects on wetlands are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning wetlands within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, limiting or avoiding vegetation clearing, and limiting the removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the spatial and temporal extent of impacts on wetland vegetation, limit the creation of new wetland and access road crossings, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on wetlands. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the B2H Project in proximity to wetlands. Table 3-84 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on wetlands.

Variations S2-A1 and S2-A2

Variation S2-A1 is anticipated to result in no residual impacts on any wetland types as no wetlands are crossed. Variation S2-A2 is anticipated to result in low residual impacts on open water wetlands. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S2-B1 and S2-B2

Variation S2-B1 is anticipated to result in low residual impacts on emergent and open water wetlands, and Variation S2-B1 is anticipated to result in low residual impacts on open water wetlands. Variation S2-B2 would result in less residual impacts on open water wetlands than Variation S2-B2 as less open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S2-C1 and S2-C2

Variation S2-C1 is anticipated to result in low residual impacts on emergent and open water wetlands, and Variation S2-C2 is anticipated to result in low residual impacts on scrub-shrub and open water wetlands. Variation S2-C1 would result in less residual impacts on open water wetlands than Variation S2-C2 as less open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S2-E1 and S2-E2

Variation S2-E1 is anticipated to result in low residual impacts on open water wetlands, and Variation S2-E2 is anticipated to result in low residual impacts on scrub-shrub and emergent wetlands. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S2-F1 and S2-F2

Variations S2-F1 and S2-F2 are anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands. Variation S2-F1 would result in a greater amount of residual impacts on scrub-shrub and emergent wetlands, and the same amount of residual impacts on open water wetlands than Variation S2-F2 as a greater amount of scrub-shrub and emergent wetlands, and the same amount of open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Glass Hill Alternative

The Glass Hill Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent and open water wetlands. The Glass Hill Alternative would result in a greater amount of residual impacts on scrub-shrub wetlands and the same amount of residual impacts on emergent and open water wetlands as compared to the Applicant's Proposed Action Alternative as a greater amount of scrub-shrub wetlands and the same amount of emergent and open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Table 3-84. Wetlands Inventory Data and Residual Impacts for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Forested Wetlands (miles)			Scrub-Shrub Wetlands (miles)			Emergent Wetlands (miles)			Open Water (miles)			Total Miles of Wetlands Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Moderate	None		Low	None		Low	None		Low	None	
Applicant's Proposed Action - Segment 2	33.8	0.0	0.0	33.8	0.7	0.7	33.1	1.7	1.7	32.1	2.2	2.2	31.6	4.6
Variation S2-A1	*2.8*	*0.0*	*0.0*	*2.8*	*0.0*	*0.0*	*2.8*	*0.0*	*0.0*	*2.8*	*0.0*	*0.0*	*2.8*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*2.9*	*0.0*	*0.0*	*2.9*	*0.0*	*0.0*	*2.9*	*0.1*	*0.1*	*2.8*	*0.1*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*3.7*	*0.0*	*0.0*	*3.7*	*0.5*	*0.5*	*3.2*	*0.5*	*0.5*	*3.2*	*1.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*3.8*	*0.0*	*0.0*	*3.8*	*0.0*	*0.0*	*3.8*	*0.7*	*0.7*	*3.1*	*0.7*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*9.3*	*0.0*	*0.0*	*9.3*	*0.1*	*0.1*	*9.2*	*0.2*	*0.2*	*9.1*	*0.3*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*8.8*	*0.1*	*0.1*	*8.7*	*0.0*	*0.0*	*8.8*	*0.3*	*0.3*	*8.5*	*0.4*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*	*2.3*	*0.1*	*0.1*	*2.2*	*0.1*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*2.6*	*0.1*	*0.1*	*2.5*	*0.1*	*0.1*	*2.5*	*0.0*	*0.0*	*2.6*	*0.2*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*12.1*	*0.6*	*0.6*	*11.5*	*1.1*	*1.1*	*11.0*	*1.0*	*1.0*	*11.1*	*2.7*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*12.2*	*0.1*	*0.1*	*12.1*	*0.3*	*0.3*	*11.9*	*1.0*	*1.0*	*11.2*	*1.4*
Glass Hill	33.7	0.0	0.0	33.7	1.0	1.0	32.7	1.7	1.7	32.0	2.2	2.2	31.5	4.9
Variation S2-D1	*4.3*	*0.0*	*0.0*	*4.3*	*0.1*	*0.1*	*4.2*	*0.0*	*0.0*	*4.3*	*0.4*	*0.4*	*3.9*	*0.5*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*4.1*	*0.1*	*0.1*	*4.0*	*0.0*	*0.0*	*4.1*	*0.5*	*0.5*	*3.6*	*0.6*
Mill Creek	34.0	0.0	0.0	34.0	0.6	0.6	33.4	0.9	0.9	33.1	2.5	2.5	31.5	4.0

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.

Variation S2-D1 and S2-D2

Variations S2-D1 and S2-D2 are anticipated to result in low residual impacts on scrub-shrub and open water wetlands. Variation S2-D1 would result in the same amount of residual impacts on scrub-shrub wetlands and less residual impacts on open water wetlands than Variation S2-D2 as the same amount of scrub-shrub wetlands and less open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Mill Creek Alternative

The Mill Creek Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent and open water wetlands. The Mill Creek Alternative would result in less residual impacts on scrub-shrub and emergent wetlands and a greater amount of residual impacts on open water wetlands as compared to the Applicant's Proposed Action Alternative as less scrub-shrub and emergent wetlands and greater amounts of open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Conclusions

All alternative routes in Segment 2 would result in low residual impacts on perennial, intermittent, and 303(d) temperature-impaired streams. The Applicant's Proposed Action Alternative and the Mill Creek Alternatives cross the least amount of streams; therefore less residual impacts on streams would be anticipated with these alternative routes as compared to the Glass Hill Alternative.

All alternative routes in Segment 2 would result in low residual impacts on scrub-shrub, emergent, and open water wetlands. No forested wetlands are crossed in Segment 2. The Mill Creek Alternative crosses the least amount of wetlands; therefore less residual impacts on wetlands would be anticipated with the Mill Creek Alternative compared to the other two alternative routes.

SEGMENT 3—BAKER VALLEY

Streams and impaired waters

Table 3-85 presents the total miles crossed and residual impacts on streams and impaired waters for all alternative routes and route variations in Segment 3. Residual impacts on 303(d) listed sediment-impaired waters are not anticipated as none are crossed by the B2H Project in Segment 3.

Table 3-85. Streams and Impaired Waters Inventory Data and Residual Impacts for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Perennial Streams (miles)			Intermittent Streams (miles)			303(d) Listed/ Temperature-Impaired Waters			Total Miles of Streams Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Low	None		Low	None		Low	None	
Applicant's Proposed Action	55.2	4.6	4.6	50.6	7.0	7.0	48.2	1.4	1.4	53.8	13.0
Variation S3-A1	*12.4*	*1.1*	*1.1*	*11.3*	*2.2*	*2.2*	*10.2*	*0.0*	*0.0*	*12.4*	*3.3*
Variation S3-A2	*12.2*	*0.1*	*0.1*	*12.1*	*2.2*	*2.2*	*10.0*	*0.0*	*0.0*	*12.2*	*2.3*
Variation S3-B1	*13.9*	*0.6*	*0.6*	*13.3*	*0.7*	*0.7*	*13.2*	*0.0*	*0.0*	*13.9*	*1.3*
Variation S3-B2	*14.4*	*0.6*	*0.6*	*13.8*	*3.1*	*3.1*	*11.3*	*0.0*	*0.0*	*14.4*	*3.7*
Variation S3-B3	*14.7*	*0.6*	*0.6*	*14.1*	*2.7*	*2.7*	*12.0*	*0.0*	*0.0*	*14.7*	*3.3*
Variation S3-B4	*14.3*	*0.5*	*0.5*	*13.8*	*2.2*	*2.2*	*12.1*	*0.0*	*0.0*	*14.3*	*2.7*
Variation S3-B5	*14.0*	*0.5*	*0.5*	*13.5*	*2.7*	*2.7*	*11.3*	*0.0*	*0.0*	*14.0*	*3.2*
Variation S3-C1	*21.1*	*2.6*	*2.6*	*18.5*	*2.2*	*2.2*	*18.9*	*1.4*	*1.4*	*19.7*	*6.2*
Variation S3-C2	*21.7*	*2.7*	*2.7*	*19.0*	*2.3*	*2.3*	*19.4*	*1.5*	*1.5*	*20.2*	*6.5*
Variation S3-C3	*21.1*	*2.8*	*2.8*	*18.3*	*3.1*	*3.1*	*18.0*	*1.5*	*1.5*	*19.6*	*7.4*
Variation S3-C4	*21.4*	*2.3*	*2.3*	*19.1*	*2.4*	*2.4*	*19.0*	*1.5*	*1.5*	*19.9*	*6.2*
Variation S3-C5	*21.0*	*1.7*	*1.7*	*19.3*	*3.7*	*3.7*	*17.3*	*0.4*	*0.4*	*20.6*	*5.8*
Variation S3-C6	*24.7*	*2.0*	*2.0*	*22.7*	*5.5*	*5.5*	*19.2*	*0.7*	*0.7*	*24.0*	*8.2*
Flagstaff A	55.3	4.5	4.5	50.8	9.0	9.0	46.3	1.4	1.4	53.9	14.9
Timber Canyon	70.3	6.8	6.8	63.5	12.5	12.5	57.8	1.8	1.8	68.5	21.1
Flagstaff A – Burnt River Mountain	55.3	4.7	4.7	50.6	9.9	9.9	45.4	1.5	1.5	53.8	16.1
Flagstaff B	56.0	4.6	4.6	51.4	9.0	9.0	47.0	1.4	1.4	54.6	15.0
Flagstaff B – Burnt River West	55.7	2.7	2.7	53.0	10.5	10.5	45.2	0.4	0.4	55.3	13.6
Flagstaff B – Durkee	59.6	4.0	4.0	55.6	12.3	12.3	47.3	0.7	0.7	58.9	17.0

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in low impacts on perennial, intermittent and 303(d) listed temperature-impaired streams.

Direct and indirect effects on streams could include temporary increases in erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative. The types of potential effects on streams are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning water resources within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance,

preventing the introduction of sediment to streams and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the creation of new stream crossings and access roads, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on streams. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in stream temperature from the indirect effects of vegetation removal near streams and headwater areas. Low residual impacts also could result from increases in sediment due to removal of streamside vegetation, bank destabilization from erosional conditions created by stream-channel alteration or heavy precipitation events carrying disturbed upslope soils from roadways or construction areas into streams. Table 3-85 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on streams.

Variations S3-A1 and S3-A2

Variations S3-A1 and S3-A2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S3-A2 would result in a greater amount of residual impacts on perennial streams and the same amount of residual impacts on intermittent streams than Variation S3-A2 as a greater amount of perennial streams and the same amount of intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S3-B1 through S3-B5

All S3-B variations are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S3-B1 would result in the least amount of residual impacts of all S3-B variations as the least amount of streams are crossed. Variation S3-B2 would result in the greatest amount of residual impacts of all variations as the greatest amount of streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S3-C1 through S3-C6

All S3-C variations are anticipated are anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed streams. Variation S3-C5 would result in the least amount of residual impacts of all variations as the least amount of streams are crossed. Variation S3-C6 would result in the greatest amount of residual impacts of all variations as the greatest amount of streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff A Alternative

The Flagstaff A Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be less on perennial streams, greater on intermittent streams, and similar on 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative as less perennial streams, a greater amount of intermittent streams, and the same amount of 303(d) listed temperature-impaired streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The Timber Canyon Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be greater on perennial streams, intermittent streams, and 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative as a greater amount of these stream types are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be greater on perennial streams, intermittent streams, and 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative as a greater amount of these stream types are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be greater on perennial streams, and similar on intermittent and 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative as a greater amount of perennial streams and the same amount of intermittent and 303(d) listed temperature-impaired streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be less on perennial and 303(d) listed temperature-impaired streams, and greater on intermittent streams than the Applicant's Proposed Action Alternative as less perennial and 303(d) listed temperature-impaired

streams and a greater amount of intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff B - Durkee

The Flagstaff B – Durkee Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be less on perennial and 303(d) listed temperature-impaired streams, and greater on intermittent streams than the Applicant's Proposed Action Alternative as less perennial and 303(d) listed temperature-impaired streams and a greater amount of intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Wetlands

The estimates of impacts on wetlands are based on the preliminary location of the B2H Project centerline. As a result, the impacts that would actually occur from construction and operations are overestimated as B2H Project components (including towers, roads, equipment storage yards, fly yards, and laydown areas) would be sited outside of wetland areas whenever possible (as is a standard engineering practice). Avoidance of wetlands and implementing design features listed in Table 2-7 would further reduce impacts on wetlands.

Table 3-86 presents the total miles crossed and residual impacts on wetlands for all alternative routes and route variations in Segment 3.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent and open water wetlands. Direct and indirect effects on wetlands could include temporary impacts on vegetation from construction, temporary increases in soil erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative, and temporary impacts from clearing of vegetation, including loss of shading and reduction or loss of flood water attenuation availability. The types of potential effects on wetlands are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning wetlands within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, limiting or avoiding vegetation clearing, and limiting removal of streamside vegetation.

The application of several selective mitigation measures aimed to reduce the spatial and temporal extent of impacts on wetland vegetation, limit the creation of new wetland and access road crossings, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on wetlands. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Table 3-86. Wetlands Inventory Data and Residual Impacts for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Forested Wetlands (miles)			Scrub-Shrub Wetlands (miles)			Emergent Wetlands (miles)			Open Water (miles)			Total Miles of Wetlands Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Moderate	None		Low	None		Low	None		Low	None	
Applicant's Proposed Action	55.2	0.5	0.5	54.7	0.4	0.4	54.8	3.2	3.2	52.0	5.0	5.0	50.2	9.1
Variation S3-A1	*12.4*	*0.0*	*0.0*	*12.4*	*0.0*	*0.0*	*12.4*	*1.1*	*1.1*	*11.3*	*0.9*	*0.9*	*11.5*	*2.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*12.2*	*0.0*	*0.0*	*12.2*	*0.2*	*0.2*	*12.0*	*0.8*	*0.8*	*11.4*	*1.0*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*13.9*	*0.0*	*0.0*	*13.9*	*0.0*	*0.0*	*13.9*	*0.7*	*0.7*	*13.2*	*0.7*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*14.4*	*0.0*	*0.0*	*14.4*	*1.1*	*1.1*	*13.3*	*1.5*	*1.5*	*12.9*	*2.6*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*14.7*	*0.0*	*0.0*	*14.7*	*1.1*	*1.1*	*13.6*	*1.5*	*1.5*	*13.2*	*2.6*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*14.3*	*0.0*	*0.0*	*14.3*	*1.0*	*1.0*	*13.3*	*1.7*	*1.7*	*12.6*	*2.7*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*14.0*	*0.0*	*0.0*	*14.0*	*1.6*	*1.6*	*12.4*	*1.6*	*1.6*	*12.4*	*3.2*
Variation S3-C1	*21.1*	*0.5*	*0.5*	*20.6*	*0.4*	*0.4*	*20.7*	*1.0*	*1.0*	*20.1*	*2.3*	*2.3*	*18.8*	*4.2*
Variation S3-C2	*21.7*	*0.5*	*0.5*	*21.2*	*0.7*	*0.7*	*21.0*	*0.9*	*0.9*	*20.8*	*2.4*	*2.4*	*19.3*	*4.5*
Variation S3-C3	*21.1*	*0.4*	*0.4*	*20.7*	*0.6*	*0.6*	*20.5*	*2.0*	*2.0*	*19.1*	*3.7*	*3.7*	*17.4*	*6.7*
Variation S3-C4	*21.4*	*0.4*	*0.4*	*21.0*	*0.6*	*0.6*	*20.8*	*1.1*	*1.1*	*20.3*	*3.1*	*3.1*	*18.3*	*5.2*
Variation S3-C5	*21.0*	*0.5*	*0.5*	*20.5*	*0.1*	*0.1*	*20.9*	*0.5*	*0.5*	*20.5*	*3.1*	*3.1*	*17.9*	*4.2*
Variation S3-C6	*24.7*	*1.2*	*1.2*	*23.5*	*0.4*	*0.4*	*24.3*	*0.7*	*0.7*	*24.0*	*4.2*	*4.2*	*20.5*	*6.5*
Flagstaff A	55.3	0.5	0.5	54.8	0.4	0.4	54.9	4.8	4.8	50.5	5.9	5.9	49.4	11.6
Timber Canyon	70.3	1.5	1.5	68.8	2.1	2.1	68.2	4.0	4.0	66.3	6.6	6.6	63.7	14.2
Flagstaff A – Burnt River Mountain	55.3	0.4	0.4	54.9	0.6	0.6	54.7	5.8	5.8	49.5	7.3	7.3	48.0	14.1
Flagstaff B	56.0	0.5	0.5	55.5	0.4	0.4	55.6	4.3	4.3	51.7	5.8	5.8	50.2	11.0
Flagstaff B – Burnt River West	55.7	0.5	0.5	55.2	0.1	0.1	55.6	2.9	2.9	52.8	6.5	6.5	49.2	10.0
Flagstaff B – Durkee	59.6	1.2	1.2	58.4	0.4	0.4	59.2	4.0	4.0	55.6	7.7	7.7	51.9	13.3

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as the same wetland type may be crossed multiple times.

Moderate residual impacts could result from effects on forested wetlands, including complete removal of individual or stands of trees or construction activities affecting tree health (including soil compaction in near tree roots, soil disturbance near tree roots or trimming of branches).

Low residual impacts could result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the B2H Project in proximity to wetlands. Table 3-86 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on wetlands.

Variations S3-A1 and S3-A2

Variations S3-A1 and S3-A2 are anticipated to result in low residual impacts on emergent and open water wetlands. Variation S3-A1 would result in a greater amount of residual impacts on emergent and open water wetlands than Variation S3-A2 as a greater amount of emergent and open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S3-B1 through S3-B5

Variations S3-B1 through S3-B5 are anticipated to result in low residual impacts on open water wetlands. Additionally, Variations S3-B2 through S3-B5 are anticipated to result in low residual impacts on emergent wetlands. Variation S3-B4 would result in the greatest amount of residual impacts of all variations as the greatest amount of wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S3-C1 through S3-C6

Variations S3-C1 through S3-C6 are anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. Variation S3-C2 would result in the greatest amount of residual impacts of all variations as the greatest amount of wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff A Alternative

The Flagstaff A Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Flagstaff A Alternative would result in the same amount of residual impacts on forested and scrub-shrub wetlands and a greater amount of residual impacts on emergent and open water wetlands as compared to the Applicant's Proposed Action Alternative as the same amount of forested and scrub-shrub wetlands and a greater amount of emergent and open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The Timber Canyon Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Timber Canyon Alternative would result in a greater amount of residual impacts on all wetland types as compared to the Applicant's Proposed Action Alternative as a greater amount of all wetland types are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Flagstaff A – Burnt River Mountain Alternative would result in less residual impacts on forested wetlands and a greater amount of residual impacts on scrub-shrub, emergent, and open water wetlands as compared to the Applicant's Proposed Action Alternative as less forested wetlands and a greater amount of scrub-shrub, emergent, and open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Flagstaff B Alternative would result in the same amount of residual impacts on forested and scrub-shrub wetlands and a greater amount of residual impacts on emergent and open water wetlands as compared to the Applicant's Proposed Action Alternative as the same amount of forested and scrub-shrub wetlands and a greater amount of emergent and open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Flagstaff B – Burnt River West Alternative would result in the same amount of residual impacts on forested wetlands, less residual impacts on scrub-shrub and emergent wetlands, and a greater amount of residual impacts on open water wetlands as compared to the Applicant's Proposed Action Alternative as the same amount forested wetlands, less scrub-shrub and emergent wetlands, and a greater amount of open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Flagstaff B - Durkee

The Flagstaff B – Durkee Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Flagstaff B – Durkee Alternative would result in the same amount of residual impacts on scrub-shrub wetlands, and a greater amount of residual impacts on forested, emergent, and open water wetlands as compared to the Applicant's Proposed Action Alternative as the same amount of scrub-shrub wetlands, and a greater amount of forested, emergent, and open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Conclusions

All alternative routes in Segment 3 would result in low residual impacts on perennial, intermittent, and 303(d) temperature-impaired streams. The Applicant's Proposed Action Alternative crosses the least amount of streams; therefore less residual impacts on streams would be anticipated with the Applicant's Proposed Action Alternative as compared to the other alternative routes.

All alternative routes in Segment 3 would result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Applicant's Proposed Action Alternative crosses the least amount of wetlands; therefore less residual impacts on wetlands would be anticipated with the Applicant's Proposed Action Alternative compared to the other alternative routes.

SEGMENT 4—BROGAN

Streams and Impaired Waters

Table 3-87 presents the total miles crossed and residual impacts on streams and impaired waters for all alternative routes and variations in Segment 4. Impacts on 303(d) listed/sediment-impaired waters are not anticipated as none are crossed by alternative routes in Segment 4.

Table 3-87. Streams and Impaired Waters Inventory Data and Residual Impacts for Segment 4—Brogan

Alternative Route	Total Length (miles)	Perennial Streams (miles)			Intermittent Streams (miles)			303(d) Listed/Temperature-Impaired Waters			Total Miles of Streams Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Low	None		Low	None		Low	None	
Applicant's Proposed Action	40.1	1.9	1.9	38.2	11.4	11.4	28.7	0.0	0.0	40.1	13.3
Variation S4-A1	*5.9*	*0.6*	*0.6*	*5.3*	*0.6*	*0.6*	*5.3*	*0.0*	*0.0*	*5.9*	*1.2*
Variation S4-A2	*6.0*	*0.6*	*0.6*	*5.4*	*0.4*	*0.4*	*5.6*	*0.0*	*0.0*	*6.0*	*1.0*
Variation S4-A3	*6.1*	*0.6*	*0.6*	*5.5*	*0.4*	*0.4*	*5.7*	*0.1*	*0.1*	*6.0*	*1.0*
Tub Mountain South	40.5	1.9	1.9	38.6	8.9	8.9	31.6	0.0	0.0	40.5	10.8
Willow Creek	34.6	1.4	1.4	33.2	9.1	9.1	25.5	0.0	0.0	34.6	10.5

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as a similar stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. No residual impacts are anticipated to 303(d) listed temperature-impaired streams as none are crossed by the Applicant's Proposed Action Alternative.

Direct and indirect effects on perennial and intermittent streams could include temporary increases in erosion and sediment associated with construction, operation, and maintenance of the Applicant's Proposed Action. The types of potential effects on streams are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning water resources within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, preventing the introduction of sediment to streams, and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the creation of new stream crossings and access roads, and to reduce soil disturbance and vegetation removal would be applied to reduce impacts on streams. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in stream temperature from the indirect effects of vegetation removal near streams and headwater areas. Low residual impacts also could result from increases in sediment due to removal of streamside vegetation, bank destabilization from erosional conditions created by stream-channel alteration or heavy precipitation events carrying disturbed upslope soils from roadways or construction areas into the stream. Table 3-87 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on streams.

Variations S4-A1 through S4-A3

Variations S4-A1 through S4-A3 are anticipated to result in low residual impacts on perennial and intermittent streams. Additionally, Variation S4-A3 is anticipated to result in low residual impacts on 303(d) listed temperature-impaired streams. Variation S4-A1 would result in the same amount of residual impacts on perennial streams and a greater amount of residual impacts on intermittent streams than the other variations as the same amount of perennial streams and a greater amount of intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The Tub Mountain South Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be the same on perennial streams and less on intermittent streams than the Applicant's Proposed Action Alternative as the same amount of perennial streams and less intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Willow Creek Alternative

The Willow Creek Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. Residual impacts would be less on perennial and intermittent streams than the Applicant's Proposed Action Alternative as less perennial and intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Wetlands

The estimates of impacts on wetlands are based on the preliminary location of the B2H Project centerline. As a result, the impacts that would actually occur from construction and operations are overestimated as B2H Project components (including towers, roads, equipment storage yards, fly yards, and laydown areas) would be sited outside of wetland areas whenever possible (as is a standard engineering practice). Avoidance of wetlands and implementing design features listed in Table 2-7 would further reduce impacts on wetlands.

Table 3-88 presents the total miles crossed and residual impacts on wetlands for all alternative routes and route variations in Segment 4.

Table 3-88. Wetlands Inventory Data and Residual Impacts for Segment 4—Brogan

Alternative Route	Total Length (miles)	Forested Wetlands (miles)			Scrub-Shrub Wetlands (miles)			Emergent Wetlands (miles)			Open Water (miles)			Total Miles of Wetlands Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Moderate	None		Low	None		Low	None		Low	None	
Applicant's Proposed Action	40.1	0.4	0.4	39.7	0.1	0.1	40.0	0.9	0.9	39.2	5.2	5.2	34.9	6.6
Variation S4-A1	*5.9*	*0.1*	*0.1*	*5.8*	*0.0*	*0.0*	*5.9*	*0.4*	*0.4*	*5.5*	*0.1*	*0.1*	*5.8*	*0.6*
Variation S4-A2	*6.0*	*0.3*	*0.3*	*5.7*	*0.3*	*0.3*	*5.7*	*0.0*	*0.0*	*6.0*	*0.3*	*0.3*	*5.7*	*0.9*
Variation S4-A3	*6.1*	*0.3*	*0.3*	*5.8*	*0.3*	*0.3*	*5.8*	*0.0*	*0.0*	*6.1*	*0.3*	*0.3*	*5.8*	*0.9*
Tub Mountain South	40.5	1.0	1.0	39.5	0.9	0.9	39.6	0.9	0.9	39.6	5.1	5.1	35.4	7.9
Willow Creek	34.6	0.4	0.4	34.2	0.1	0.1	34.5	0.7	0.7	33.9	5.5	5.5	29.1	6.7

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as a similar wetland type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent and open water wetlands. Direct and indirect effects on wetlands could include temporary impacts on vegetation from construction, temporary increases in soil erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative, and temporary impacts from removal of vegetation, including loss of shading and reduction or loss of flood water attenuation. The types of potential effects on wetlands are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning wetlands within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, limiting or avoiding vegetation clearing, and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the spatial and temporal extent of impacts on wetland vegetation, limit the creation of new wetland and access road crossings, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on wetlands. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Moderate residual impacts could result from effects on forested wetlands, including complete removal of individual trees or portions of tree stands or construction activities affecting tree health (including soil compaction in near tree roots, soil disturbance near tree roots or trimming of branches).

Low residual impacts could result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the B2H Project in proximity to wetlands. Table 3-88 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on wetlands.

Variation S4-A1 through S4-A3

Variations S4-A1 through S4-A3 are anticipated to result in low residual impacts on open water wetlands and moderate residual impacts on forested wetlands. Additionally, Variations S4-A2 and S4-A3 are anticipated to result in low residual impacts on scrub-shrub wetlands, and Variation S4-A1 is anticipated to result in low residual impacts on emergent wetlands. Variation S4-A1 would result in less residual impacts on forested and open water wetlands than the other variations as less forested and open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The Tub Mountain South Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Tub Mountain South Alternative would result in a greater amount of residual impacts on forested and scrub-shrub wetlands, the same amount of residual impacts on emergent wetlands, and less residual impacts on open water wetlands as compared to the Applicant's Proposed Action Alternative as a greater

amount of forested and scrub-shrub wetlands, the same amount of emergent wetlands, and less open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Willow Creek Alternative

The Willow Creek Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Willow Creek Alternative would result in the same amount of residual impacts on forested and scrub-shrub wetlands, less residual impacts on emergent wetlands, and a greater amount of residual impacts on open water wetlands as compared to the Applicant's Proposed Action Alternative as the same amount of forested and scrub-shrub wetlands, less emergent wetlands, and a greater amount of open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Conclusions

All alternative routes in Segment 4 would result in low residual impacts on perennial and intermittent streams. The Willow Creek Alternative crosses the least amount of streams; therefore less residual impacts on streams would be anticipated with the Willow Creek Alternative as compared to the other alternative routes.

All alternative routes in Segment 4 would result in low residual impacts on scrub-shrub, emergent, and open water wetlands, and moderate residual impacts on forested wetlands. The Applicant's Proposed Action Alternative crosses the least amount of wetlands; therefore less residual impacts on wetlands would be anticipated with the Applicant's Proposed Action Alternative compared to the other alternative routes.

SEGMENT 5—MALHEUR AREA

Streams and Impaired Waters

Table 3-89 presents the total miles crossed and residual impacts on streams and impaired waters for all alternative routes and route variations in Segment 5. Impacts on 303(d) listed/sediment-impaired waters are not anticipated as none are crossed by alternative routes in Segment 5.

Table 3-89. Streams and Impaired Waters Inventory Data and Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Perennial Streams (miles)			Intermittent Streams (miles)			303(d) Listed/ Temperature-Impaired Waters			Total Miles of Streams Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Low	None		Low	None		Low	None	
Applicant's Proposed Action	40.4	1.5	1.5	38.9	10.7	10.7	29.7	0.0	0.0	40.4	12.2
Variation S5-A1	*7.4*	*0.1*	*0.1*	*7.3*	*1.6*	*1.6*	*5.8*	*0.0*	*0.0*	*7.4*	*1.7*
Variation S5-A2	*7.4*	*0.2*	*0.2*	*7.2*	*2.0*	*2.0*	*5.4*	*0.0*	*0.0*	*7.4*	*2.2*
Variation S5-B1	*2.5*	*0.6*	*0.6*	*1.9*	*0.2*	*0.2*	*2.3*	*0.0*	*0.0*	*2.5*	*0.8*
Variation S5-B2	*2.8*	*0.3*	*0.3*	*2.5*	*0.1*	*0.1*	*2.7*	*0.0*	*0.0*	*2.8*	*0.4*
Malheur S	43.5	1.3	1.3	42.2	11.4	11.4	32.1	0.1	0.1	43.4	12.7
Malheur A	43.1	1.3	1.3	41.8	11.2	11.2	31.9	0.1	0.1	43.0	12.5

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in low residual impacts on perennial and intermittent streams. No residual impacts are anticipated to 303(d) listed temperature-impaired streams, as none are crossed by the Applicant's Proposed Action Alternative.

Direct and indirect effects on perennial and intermittent streams could include temporary increases in erosion and sediment associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative. The types of potential effects on streams are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning water resources within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, preventing the introduction of sediment to streams, and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the creation of new stream crossings and access roads, and to reduce soil disturbance and vegetation removal would be applied to reduce impacts on streams. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in stream temperature from the indirect effects of vegetation removal near streams and headwater areas. Low residual impacts also could result from increases in sediment due to removal of streamside vegetation, bank destabilization from erosional conditions created by stream-channel alteration or heavy precipitation events carrying disturbed upslope soils from roadways or construction areas into the stream. Table 3-89 summarizes

the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on streams.

Variations S5-A1 and S5-A2

Variations S5-A1 and S5-A2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S5-A1 would result in less residual impacts on perennial and intermittent streams than Variation S5-A2 as less perennial and intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S5-B1 and S5-B2

Variations S5-B1 and S5-B2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S5-B1 would result in a greater amount of residual impacts on perennial and intermittent streams than Variation S5-B2 as a greater amount of perennial and intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Malheur S Alternative

The Malheur S Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be less on perennial streams, and greater on intermittent and 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative as less perennial streams and a greater amount of intermittent and 303(d) listed temperature-impaired streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Malheur A Alternative

The Malheur A Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed temperature-impaired streams. Residual impacts would be less on perennial streams, and greater on intermittent and 303(d) listed temperature-impaired streams than the Applicant's Proposed Action Alternative as less perennial streams and a greater amount of intermittent and 303(d) listed temperature-impaired streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Wetlands

The estimates of impacts on wetlands are based on the preliminary location of the B2H Project centerline. As a result, the impacts that would actually occur from construction and operations are overestimated as B2H Project components (including towers, roads, equipment storage yards, fly yards, and laydown areas) would be sited outside of wetland areas whenever possible (as is a standard

engineering practice). Avoidance of wetlands and implementing design features listed in Table 2-7 would likely further reduce impacts on wetlands.

Table 3-90 presents the total miles crossed and residual impacts on wetlands for all alternative routes and route variations in Segment 5.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent and open water wetlands. Direct and indirect effects on wetlands could include temporary impacts on vegetation from construction, temporary increases in soil erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative, and temporary impacts from removal of vegetation, including loss of shading and reduction or loss of flood water attenuation. The types of potential effects on wetlands are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning wetlands within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, limiting or avoiding vegetation clearing, and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the spatial and temporal extent of impacts on wetland vegetation, limit the creation of new wetland and access road crossings, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on wetlands. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the B2H Project in proximity to wetlands. Table 3-90 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on wetlands.

Variations S5-A1 and S5-A2

Variations S5-A1 through S5-A2 are anticipated to result in low residual impacts on open water wetlands. Additionally, Variation S5-A1 is anticipated to result in low residual impacts on emergent wetlands. Variation S5-A1 would result in a greater amount of residual impacts on open water wetlands than Variation S5-A2 as a greater amount of open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Table 3-90. Wetlands Inventory Data and Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Forested Wetlands (miles)			Scrub-Shrub Wetlands (miles)			Emergent Wetlands (miles)			Open Water (miles)			Total Miles of Wetlands Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Moderate	None		Low	None		Low	None		Low	None	
Applicant's Proposed Action	40.4	0.0	0.0	40.4	0.1	0.1	40.3	0.6	0.6	39.8	3.6	3.6	36.8	12.2
Variation S5-A1	*7.4*	*0.0*	*0.0*	*7.4*	*0.0*	*0.0*	*7.4*	*0.2*	*0.2*	*7.2*	*1.0*	*1.0*	*6.4*	*1.7*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*7.4*	*0.0*	*0.0*	*7.4*	*0.0*	*0.0*	*7.4*	*0.9*	*0.9*	*6.5*	*2.2*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*2.5*	*0.1*	*0.1*	*2.4*	*0.1*	*0.1*	*2.4*	*0.7*	*0.7*	*1.8*	*0.8*
Variation S5-B2	*2.8*	*0.1*	*0.1*	*2.7*	*0.6*	*0.6*	*2.2*	*0.4*	*0.4*	*2.4*	*0.8*	*0.8*	*2.0*	*1.4*
Malheur S	43.5	0.0	0.0	43.5	0.2	0.2	43.3	0.3	0.3	43.2	4.7	4.7	38.8	12.7
Malheur A	43.1	0.0	0.0	43.1	0.0	0.0	43.1	0.3	0.3	42.8	4.7	4.7	38.4	12.5

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as a similar wetland type may be crossed multiple times.

Variations S5-B1 and S5-B2

Variations S5-B1 through S5-B2 are anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands. Additionally, Variation S5-B2 is anticipated to result in moderate residual impacts on forested wetlands. Variation S5-B1 would result in less residual impacts on scrub-shrub, emergent, and open water wetlands than Variation S5-B2 as less of these wetland types are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Malheur S Alternative

The Malheur S Alternative is anticipated to result in low residual impacts on scrub-shrub, emergent, and open water wetlands. The Malheur S Alternative would result in a greater amount of residual impacts on scrub-shrub and open water wetlands and less residual impacts on emergent wetlands as compared to the Applicant's Proposed Action Alternative as a greater amount of scrub-shrub and open water wetlands and less emergent wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Malheur A Alternative

The Malheur A Alternative is anticipated to result in low residual impacts on emergent and open water wetlands. The Malheur A Alternative would result in less residual impacts on emergent wetlands and a greater amount of residual impacts on open water wetlands as compared to the Applicant's Proposed Action Alternative as less emergent wetlands and a greater amount of open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Conclusions

All alternative routes in Segment 5 would result in low residual impacts on perennial and intermittent streams. Additionally, the Malheur S and Malheur A Alternatives would result in low residual impacts on 303(d) listed temperature-impaired streams. The Applicant's Proposed Action Alternative crosses the least amount of streams; therefore less residual impacts on streams would be anticipated with the Applicant's Proposed Action Alternative as compared to the other alternative routes.

All alternative routes in Segment 5 would result in low residual impacts on emergent and open water wetlands. Additionally, the Applicant's Proposed Action Alternative and the Malheur S Alternative would result in low residual impacts on scrub-shrub wetlands. The Applicant's Proposed Action Alternative crosses the least amount of wetlands; therefore less residual impacts on wetlands would be anticipated with the Applicant's Proposed Action Alternative compared to the other alternative routes. None of the alternative routes in Segment 5 cross forested wetlands.

SEGMENT 6—TREASURE VALLEY

Streams and Impaired Waters

Table 3-91 presents the total miles crossed and residual impacts on streams and impaired waters for all alternative routes and route variations in Segment 6. Impacts on 303(d) listed/temperature-impaired waters are not anticipated as none are crossed by the alternative routes in Segment 6.

Table 3-91. Streams and Impaired Waters Inventory Data and Residual Impacts for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Perennial Streams (miles)			Intermittent Streams (miles)			303(d) Listed/Sediment-Impaired Waters			Total Miles of Streams Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Low	None		Low	None		Low	None	
Applicant's Proposed Action	28.0	0.7	0.7	27.3	5.7	5.7	22.3	0.2	0.2	27.8	6.4
Variation S6-A1	*9.3*	*0.2*	*0.2*	*9.1*	*2.3*	*2.3*	*7.0*	*0.0*	*0.0*	*9.3*	*2.5*
Variation S6-A2	*8.9*	*0.1*	*0.1*	*8.8*	*2.2*	*2.2*	*6.7*	*0.0*	*0.0*	*8.9*	*2.3*
Variation S6-B1	*14.4*	*0.2*	*0.2*	*14.2*	*3.1*	*3.1*	*11.3*	*0.2*	*0.2*	*14.2*	*3.3*
Variation S6-B2	*14.1*	*0.3*	*0.3*	*13.8*	*3.0*	*3.0*	*11.1*	*0.1*	*0.1*	*14.0*	*3.3*

Table Note: Inventory data columns represent total miles of stream types crossed by the B2H Project and do not equal the total length as the same stream type may be crossed multiple times.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed sediment-impaired streams. Direct and indirect effects on perennial and intermittent streams could include temporary increases in erosion and sediment associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative. Direct and indirect effects on 303(d) listed sediment-impaired streams could include temporary fluctuations in sediment load and turbidity due to removal of sediment controlling vegetation. The types of potential effects on wetlands are discussed in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning water resources within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, preventing the introduction of sediment to streams and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the creation of new stream crossings and access roads, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on streams. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Low residual impacts could result from permanent increases in stream temperature from the indirect effects of vegetation removal near streams and headwater areas. Low residual impacts also could result from increases in sediment due to removal of streamside vegetation, bank destabilization from

erosional conditions created by stream-channel alteration or heavy precipitation events carrying disturbed upslope soils from roadways or construction areas into the stream. Table 3-91 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on streams.

Variations S6-A1 and S6-A2

Variations S6-A1 and S6-A2 are anticipated to result in low residual impacts on perennial and intermittent streams. Variation S6-A1 would result in a greater amount of residual impacts on perennial and intermittent streams than Variation S6-A2 as a greater amount of perennial and intermittent streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B2 are anticipated to result in low residual impacts on perennial, intermittent, and 303(d) listed sediment-impaired streams. Variation S6-B1 would result in less residual impacts on perennial streams and a greater amount of residual impacts on intermittent and 303(d) listed sediment-impaired streams than Variation S6-B2 as less perennial streams and a greater amount of intermittent and 303(d) listed sediment-impaired streams are crossed. Direct and indirect effects on streams, and the application of design features and selective mitigation measures to minimize impacts on streams, would be similar to those described for the Applicant's Proposed Action Alternative.

Wetlands

The estimates of impacts on wetlands are based on the preliminary location of the B2H Project centerline. As a result, the impacts that would actually occur from construction and operations are overestimated as B2H Project components (including towers, roads, equipment storage yards, fly yards, and laydown areas) would be sited outside of wetland areas whenever possible (as is a standard engineering practice). Avoidance of wetlands and implementing design features listed in Table 2-7 would likely further reduce the impact on wetlands.

Table 3-92 presents the total miles crossed and residual impacts on wetlands for all alternative routes and route variations in Segment 6.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in moderate residual impacts on forested wetlands and low residual impacts on scrub-shrub, emergent and open water wetlands.

Table 3-92. Wetlands Inventory Data and Residual Impacts for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Forested Wetlands (miles)			Scrub-Shrub Wetlands (miles)			Emergent Wetlands (miles)			Open Water (miles)			Total Miles of Wetlands Crossed
		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		Inventory Data	Residual Impacts		
			Moderate	None		Low	None		Low	None		Low	None	
Applicant's Proposed Action	28.0	0.2	0.2	27.8	0.3	0.3	27.7	0.4	0.4	27.6	2.3	2.3	25.7	3.2
Variation S6-A1	*9.3*	*0.0*	*0.0*	*9.3*	*0.2*	*0.2*	*9.1*	*0.3*	*0.3*	*9.0*	*1.2*	*1.2*	*8.1*	*1.7*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*8.9*	*0.0*	*0.0*	*8.9*	*0.3*	*0.3*	*8.6*	*0.4*	*0.4*	*8.5*	*0.7*
Variation S6-B1	*14.4*	*0.2*	*0.2*	*14.2*	*0.1*	*0.1*	*14.3*	*0.1*	*0.1*	*14.3*	*0.3*	*0.3*	*14.1*	*0.7*
Variation S6-B2	*14.1*	*0.2*	*0.2*	*13.9*	*0.0*	*0.0*	*14.1*	*0.1*	*0.1*	*14.0*	*0.3*	*0.3*	*13.8*	*0.6*

Table Note: Inventory data columns represent total miles of wetland types crossed by the B2H Project and do not equal the total length as a similar wetland type may be crossed multiple times.

Direct and indirect effects on wetlands could include temporary impacts on vegetation from construction, temporary increases in soil erosion and sedimentation associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative, and temporary impacts from removal of vegetation, including loss of shading and reduction or loss of flood water attenuation availability. The types of potential effects on wetlands are discussed in greater detail in Section 3.2.2.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through spanning wetlands within the limits of standard structure design, avoiding surface-disturbing activities in RCAs, reducing the spatial and temporal extent of disturbance, limiting or avoiding vegetation clearing, and limiting removal of streamside vegetation. The application of several selective mitigation measures aimed to reduce the spatial and temporal extent of impacts on wetland vegetation, limit the creation of new wetland and access road crossings, and to reduce soil disturbance and vegetation removal also would be applied to reduce impacts on wetlands. Refer to the list of applicable design features and selective mitigation measures in Section 3.2.2.4.

Moderate residual impacts could result from effects on forested wetlands, including complete removal of individual trees or portions of tree stands or construction activities affecting tree health (including soil compaction in near tree roots, soil disturbance near tree roots or trimming of branches). Low residual impacts could result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the B2H Project in proximity to wetlands. Table 3-92 summarizes the expected level of initial impacts, applied selective mitigation measures and resulting residual impacts on wetlands.

Variations S6-A1 and S6-A2

Variations S6-A1 and S6-A2 are anticipated to result in low residual impacts on emergent and open water wetlands. Additionally, Variation S6-A1 is anticipated to result in low residual impacts on scrub-shrub wetlands. Variation S6-A1 would result in the same amount of residual impacts on emergent wetlands and a greater amount of residual impacts on open water wetlands than Variation S6-A2 as the same amount of emergent wetlands and a greater amount of open water wetlands are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B2 are anticipated to result in low residual impacts on emergent and open water wetlands and moderate residual impacts on forested wetlands. Additionally, Variation S6-B1 is anticipated to result in low residual impacts on scrub-shrub wetlands. Variation S6-B1 would result in the same amount of residual impacts on emergent, open water, and forested wetlands as Variation S6-B2 as the same amount of these wetland types are crossed. Direct and indirect effects on wetlands, and the application of design features and selective mitigation measures to minimize impacts on wetlands, would be similar to those described for the Applicant's Proposed Action Alternative.

Conclusions

All variations of the Applicant's Proposed Action Alternative in Segment 6 would result in low residual impacts on perennial and intermittent streams. Additionally, Variations S6-B1 and S6-B2 would result in low residual impacts on 303(d) listed temperature-impaired streams. Variation S6-A2 crosses less streams than Variation S6-A1; therefore less residual impacts on streams would be anticipated with Variation S6-A2 as compared to Variation S6-A1. Variation S6-B2 crosses less streams than Variation S6-B1; therefore less residual impacts on streams would be anticipated with Variation S6-B2 as compared to Variation S6-B1.

All variations of the Applicant's Proposed Action Alternative in Segment 6 would result in low residual impacts on emergent and open water wetlands. Additionally, Variations S6-B1 and S6-B2 would result in low residual impacts on forested wetlands and Variation S6-B1 would result in low residual impacts on scrub-shrub wetlands. Variation S6-A2 crosses less wetlands than Variation S6-A1; therefore less residual impacts on wetlands would be anticipated with Variation S6-A2 as compared to Variation S6-A1. Variation S6-B2 crosses less wetlands than Variation S6-B1; therefore less residual impacts on wetlands would be anticipated with Variation S6-B2 as compared to Variation S6-B1.

3.2.3 VEGETATION

3.2.3.1 INTRODUCTION

Vegetation resources discussed in this section include vegetation communities, special status plant species, traditional foods and ethnobotanical resources, and noxious weeds that occur or have the potential to occur within the B2H Project area. This section describes the existing conditions and trends of the vegetation communities and special status plant species within the B2H Project area and the potential effects of siting, construction, and operation of the B2H Project on these resources. In addition, this section also discusses the presence of noxious weeds in the vegetation resources study corridor and the potential for their spread due to B2H Project activities. Species that warrant increased management attention that will be discussed in detail below include USFWS candidate, proposed, and threatened and endangered plant species; BLM and USFS sensitive plant species; Oregon endangered or threatened; and noxious weed species.

3.2.3.2 REGULATORY FRAMEWORK

Implementation of the B2H Project would need to be consistent with appropriate statutes, regulations, plans, programs, and policies of federal agencies, state and local governments, and affiliated tribes.

FEDERAL

Endangered Species Act

The ESA was enacted in 1973. This law established a regulatory system to protect species that are at risk of extinction. Plant species listed under the ESA are protected from any acts prohibited under Section 9(a)(2); these acts include import and export, removal and possession from areas under federal jurisdictions, malicious damage to areas under federal jurisdiction, transport or carry by any means in the course of a commercial activity, and sale or offer for sale in interstate or foreign commerce (ESA, as amended, section 9(a)(2) 50 CFR 17.61 and 50 CFR 17.71).

The USFWS oversees administration of the ESA, maintains and reviews the list of plant species protected under the ESA, designates areas of critical habitat that are crucial for species recovery, and establishes species recovery plans.

Bureau of Land Management 6840 Manual and Policy

The BLM's objective regarding sensitive species is to provide protections that are consistent with the ESA to conserve or recover listed species and their associated ecosystems and to ultimately achieve long-term recovery and delisting. The authority for this policy is provided to the BLM by a number of regulations, including the ESA, the Sikes Act, the Federal Land Policy and Management Act (FLPMA), and departmental manuals. It is the BLM's policy that “actions authorized by the BLM shall further the conservation and/or recovery of federally listed species and conservation of Bureau sensitive species,” and, “Bureau listed species shall be managed consistent with species and habitat management objectives in land-use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA” (BLM 2008).

U.S. Forest Service Manual 2672: Planning for Management and Recovery

To ensure that USFS actions do not affect listed species, the USFS Manual, through a series of policies, directs the management of sensitive species on USFS lands. Pursuant to this goal, USFS Manual 2672 Chapter 2672.41 directs biological evaluations with the objective of ensuring “that the Forest Service actions do not contribute to loss of viability of threatened, endangered, proposed, or sensitive plant and animal species, or contribute to a trend towards federal listing under the Endangered Species Act of any species.” Additionally, the USFS is to incorporate in its biological evaluations "concerns for sensitive species throughout the planning process, identifying opportunities for enhancement and reducing any potentially negative impacts" (USFS 2006).

Federal Land Policy and Management Act

The FLPMA (43 U.S.C. 1701) as amended, consolidates and articulates BLM and USFS management responsibilities and governs most uses of federal lands, including authorization to grant or renew rights-of-way. In accordance with FLPMA, BLM, and USFS must make land-use decisions based on principles of multiple use and sustained yield. As such, a grant of right-of-way must be limited to its necessary use and must contain terms and conditions that reflect the agencies’ management responsibilities under the FLPMA, including minimizing impacts on fish and wildlife habitat.

National Forests Management Act

The National Forests Management Act (NFMA), as amended, and its implementing regulations under 36 CFR 219, consolidate and articulate USFS management responsibilities for lands and resources of the National Forest System. The NFMA requires that each national forest develop a management program based on multiple-use, sustained-yield principles and implement a land-management plan for each unit of the National Forest System. The implementing regulations at the time the current forest plans were approved required the identification of Management Indicator Species (MIS) 36 CFR 219.19). MIS were selected because their population changes were believed to indicate the effects of management activities on habitats or other species of selected major biological communities or water quality. The land-management plan established objectives for the maintenance and improvement of habitat for the MIS.

Forest and Rangeland Renewable Resources Planning Act

The Forest and Rangeland Renewable Resources Planning Act, (FRRRPA), as amended by the NFMA consolidates and articulates USFS management responsibilities similar to those described under the NFMA. The FRRRPA requires the assessment, planning, and monitoring of national forest resources with periodic display to Congress facilitating the direction of goods and services to be produced from the nation’s forests.

Federal Invasive/Noxious Species Laws and Regulations

The Federal Noxious Weed Act of 1974, as amended in 1990 (7 U.S.C. 2814), requires federal land-managing agencies to develop a management program for the control of plants classified under federal

or state law as undesirable, noxious, or harmful and to cooperate with state governments in the control of undesirable plants on federal lands. The Carlson-Foley Act of 1968 (Public Law 90-583, 43 U.S.C. 1241) also provides for the control of noxious plants on federal lands by permitting the appropriate state agency to enter such lands to destroy noxious plants. The U.S. Department of Agriculture Noxious Plant List, the BLM National List of Noxious Weed Species of Concern, and individual BLM RMPs and USFS LRMPs provide additional direction for the designation and management of invasive and noxious weed species on lands they manage.

In 2005, Region 6 of the USFS published a ROD for the Invasive Plant Program. This plan provides invasive plant management direction for all National Forest LRMPs in the Pacific Northwest Region. The management direction includes invasive plant prevention and treatment/restoration standards intended to help achieve stated desired future conditions, goals and objectives (USFS 2005).

In 2009 the Department of the Interior amended the BLM's land-use plans (LUPs) in 11 contiguous western states to designate energy transport corridors (West-wide Energy Corridors), consistent with the requirements of Section 368 of the Energy Policy Act of 2005 (USFS 2009a). This decision also adopted a series of Interagency Operating Procedures, which include management practices and specific requirements related to invasive plant species to approve right-of-way grants within the designated corridors.

STATE THREATENED AND ENDANGERED SPECIES

Oregon passed ORS 564.105 with the goal of conservation of threatened or endangered vegetation species through "the use of methods and procedures necessary to bring a species to the point at which [protective] measures are no longer necessary" (ORS 496.171[1]). Species listed as threatened or endangered by Oregon include all native species listed under the Federal ESA as of May 15, 1987, as well as any additional native species determined by the appropriate state agency to be in danger of extinction throughout a large portion of the species' range within Oregon. For facilities that are regulated by the Energy Facility Siting Council (EFSC), such as the B2H Project, jurisdiction and rules for Oregon endangered and threatened plant species extend to all lands in Oregon, regardless of land ownership. The B2H Project and other facilities that are regulated by EFSC must comply with the EFSC Threatened and Endangered Species standard (OAR 345-022-0070) which requires that EFSC find the facilities are not likely to cause a significant reduction in the likelihood of survival or recovery of the species. In addition to federal protections for special status plants on federal land, OAR 345-022-0070 is applicable to all threatened and endangered plant species in Oregon, throughout the life of the project, on all land in Oregon regardless of land ownership, including federal, state, county, city, or private lands. Applicants must be in compliance with these and other applicable state statutes to receive a site certificate from EFSC to construct and operate the facility. Enforcement and management for the state law is the responsibility of EFSC as well as state agencies with implementing authority over their own rules and statutes, such as Oregon Department of Agriculture for threatened and endangered plant species.

Unlike Oregon, the State of Idaho does not have State threatened and endangered species. The Idaho Department of Species Conservation oversees protection of federally listed threatened and endangered plants on state, county and city lands. The State of Idaho does not have rules or regulations protecting other categories of special status plant species on state, county, city, or private land. The Idaho Department of Fish and Game maintains site-specific data on Idaho's sensitive plant species and other rare plants, but does not regulate plant species on state lands. Owyhee County encourages protections for other special status plants but does not have requirements for protections on county lands.

Noxious Weeds

Oregon

The Oregon State Weed Board, established under ORS 561.650, provides direction to control noxious weeds at the state level and develops and maintains the state noxious weed list. The State Weed Board and the ODA classify noxious weeds in Oregon in accordance with the ODA Noxious Weed Classification System. There are three designations under the state's system:

- Class "A" State Noxious Weed: A weed of known economic importance that is not known to occur in Oregon or is in small enough infestations to make eradication/containment possible; however, its presence in neighboring states make future occurrence seem imminent
- Class "B" State Noxious Weed: A weed of economic importance that is regionally abundant but may have limited distribution in some counties
- Class "T" State Noxious Weed: A priority noxious weed designated by the State Weed Board as a target species on which the ODA would develop and implement a statewide management plan; "T"- designated noxious weeds are species selected from either the "A" or "B" list

In addition to the ODA Noxious Weed Classification System used by the state, each county in Oregon uses a separate weed classification system and maintains a separate list of county noxious weeds. These lists also use a 3-point designation classification system; however, the definition of each designation differs slightly from the state classification system. The county classification system is as follows:

- Class "A" County Noxious Weed: A weed of known economic/environmental importance that is known to occur in the county in small enough numbers to make eradication practicable or that is not known to occur but its status in surrounding counties makes future occurrence seem imminent
- Class "B" County Noxious Weed: A weed of known economic/environmental importance that is of moderate to wide distribution, is highly invasive, and is subject to intensive control or eradication, where feasible, at the county level
- Class "C" County Noxious Weed: A weed of known economic/environmental importance and of general distribution that is subject to control or eradication as local conditions warrant

Idaho

The Idaho Noxious Weed Law (Idaho Code and Statutes, Title 22, Chapter 24) is the basis for the management and control of noxious weeds by Idaho. The Idaho State Department of Agriculture (ISDA) is responsible for administering the state noxious weed law. Noxious Weeds Rules (Idaho Administrative Procedures Act, 02.06.22) designate weeds as noxious statewide. Idaho's noxious weeds are divided into three categories defined as follows (ISDA 2012):

- Statewide Early Detection and Rapid Response Noxious Weed List: If any of these weeds are found in Idaho, they shall be reported to the ISDA within 10 days of positive identification by the University of Idaho or another qualified authority as approved by the ISDA director. These weeds shall be eradicated during the same growing season as the one in which they are identified.
- Statewide Control Noxious Weed List: These weeds are known to exist in varying populations throughout the state. The concentration of these weeds is at a level where control and/or eradication may be possible. The weed-control authority shall develop a written plan for weeds on the list that specifies active control methods to reduce the known population in no more than 5 years. The plan shall be available to the ISDA on request.
- Statewide Containment Noxious Weed List: These weeds are known to exist in various populations throughout the state. Weed-control efforts may be directed at reducing or eliminating new or expanding weed populations, while known and established weed populations, as determined by the weed-control authority, may be managed by any approved weed-control method, as determined by the weed-control authority.

3.2.3.3 Issues Identified for Analysis

The following summarizes (1) vegetation resources-related issues that were raised by the public, Native American tribes, or federal and state agencies during scoping or (2) vegetation resources-related issues that must be considered as stipulated by law or regulation.

- What would be the effects of the B2H Project on plant species that are federally listed (under the ESA), state listed, or listed as a sensitive plant species by the USFS or BLM?
- What effects would the B2H Project have on old-growth forests and riparian areas?
- Will disturbed areas be restored after construction?
- What effects would the B2H Project have on fire regimes in the B2H Project area?
- Could the B2H Project result in the introduction or spread of noxious weeds?
- How will vegetation be managed within the transmission line corridor? Will herbicide be the primary mode of vegetation management? What will be the effects of herbicide applications?

3.2.3.4 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.2 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on vegetation.

DATA SOURCES

Several data sources were used to identify and analyze B2H Project impacts on vegetation communities, traditional foods and other ethnobotanical resources, noxious weeds, and special status plant species. Vegetation communities were identified from the Regional NWGAP Analysis Program dataset, as well as from several aquatic feature datasets that were used to identify vegetation communities associated with aquatic systems. Traditional foods and potential ethnobotanical resources were identified from ethnographic studies. A list of noxious weeds likely to exist in the B2H Project area was compiled from federal, state, and county lists of noxious weeds. Known locations of noxious weed infestations were determined from weed databases maintained by federal or state agencies. Special status plant species included USFWS endangered, threatened, proposed, and candidate species occurring in Oregon and Idaho; species determined by the BLM to be sensitive in Oregon or Idaho; species determined by the USFS to be sensitive in Oregon; and species listed as endangered or threatened in Oregon by the ODA. Occurrence datasets for the special status plant species were collected from several sources, including BLM and USFS databases, the ORBIC, the IDFG, and preliminary plant surveys of the B2H Project area.

This initial coarse-filter assessment of vegetation resources was conducted using planning documents, BLM RMPs, USFS LRMP, B2H Project-specific field studies, existing digital data sources both publicly available like ODA Weedmapper and agency internal databases like GeoBOB, and previously conducted studies. Specific sources reviewed included:

- Vegetation Communities
  - Northwest Regional GAP Analysis Program (NWGAP)
  - Terrestrial Ecological Systems Mapper (NatureServe)
  - Fire Boundary Data (USGS)
- Riparian Conservation Areas
  - Oregon Wetlands Cover (Institute for Natural Resources and The Wetlands Conservancy)
  - National Wetlands Inventory Wetlands Mapper (USFWS)
  - StreamNet (BLM)
  - National Hydrography Dataset (NHD; USGS)
  - NWGAP
- Federally Listed and Sensitive Plant Species
  - Environmental Conservation Online System (USFWS)
  - ORBIC (Institute for Natural Resources)
  - Idaho Fish and Wildlife Information System (IFWIS; IDFG)
  - Geographic Biotics Observation System (GeoBOB; BLM)
  - Natural Resource Manager – Threatened, Endangered, & Sensitive Plants – Invasive Species (NRM TESP-IS; USFS)
  - Preconstruction surveys (Tetratech 2011-2014)

- Noxious Weeds
  - National Invasive Species Information Management System (NISIMS; BLM)
  - Weedmapper (ODA)
  - NRM TESP-IS (USFS)
- Resource Management Plans
  - Baker Resource Management Plan (BLM 1989)
  - Southeastern Oregon Resource Management Plan (BLM 2002)
  - Owyhee Resource Management Plan (BLM 1999)
  - Wallowa-Whitman National Forest LRMP (USFS 1990)

ANALYSIS AREA

In general, the study corridor for vegetation resources was defined as a 1-mile-wide analysis corridor: 0.5 mile on either side of the alternative route centerlines. The 1-mile-wide analysis corridor was chosen because it is large enough to encapsulate the existing vegetation communities in the vicinity of the B2H Project area, as well as the extent of potential direct and indirect impacts on vegetation communities that could occur during construction and operation. The 1-mile-wide vegetation resources study corridor also was used for the analysis of traditional foods and other ethnobotanical resources and noxious weeds because these resources were analyzed within the context of the vegetation communities. Traditional foods and ethnobotanical resources include plants important to tribal groups for subsistence, economic, medical and ceremonial purposes.

A 10-mile-wide analysis corridor (5 miles on either side of the alternative route centerlines) also was defined for identification of special status plant species that could be affected by the B2H Project. Special status plant species include all plant species listed as endangered, threatened, or a candidate to be listed under the ESA, listed as endangered or threatened by Oregon, or considered sensitive by the BLM or USFS. This larger study corridor was chosen to account for the potential uncertainty of the presence (limited survey coverage) and locations (inaccurate or historical mapping techniques) of many special status plant species populations in the vicinity of the B2H Project area. Any species with known or suspected occurrences within the 10-mile-wide special status plant species study corridor were considered potentially present and could be affected by the Proposed Action and the alternatives.

VEGETATION COMMUNITY CLASSIFICATION

A multitude of vegetation communities ranging from semi-desert Grasslands and shrub-steppe to montane and subalpine Conifer Forests occur within the B2H Project area. For the purposes of this analysis, a variety of ecological systems and vegetation community subtypes that occur within the vegetation resources study corridor were compiled into eight primary vegetation communities and 17 vegetation community subtypes.

The primary vegetation communities were based on the relative abundance of the physiognomy of the major life forms (i.e., grass, forb, shrub, and tree) and degree of anthropogenic modification or disturbance. Primary vegetation communities were further separated into vegetation community

subtypes based on the dominant species and shared biotic and abiotic factors (i.e., soils, precipitation, temperature, elevation, and topography) which shape them.

Vegetation community subtypes comprise various ecological systems described in *Ecological Systems of the Columbia Plateau, Blue Mountains, and Snake River Plain* (NatureServe 2006) that correspond to a number of macrogroups defined in the National Vegetation Classification System (NVCS). Instruction Memorandum 2013-111, *The National Vegetation Classification and Associated Mapping Standards for Bureau of Land Management Planning Documents and Assignment of State-level Vegetation Classification Data Stewards*, directs the BLM to use or crosswalk and reference the NVCS for all fine-scale assessments and project-level documents to describe existing vegetation. A crosswalk between the primary vegetation communities, subtypes, and ecological systems is presented in Table D-2 in Appendix D.

The eight primary vegetation communities and 17 vegetation community subtypes within the 1-mile analysis corridor are:

- Agriculture
  - Agriculture
- Bare Ground, Cliffs, Talus
  - Bare Ground, Cliffs and Talus
- Developed/Disturbed Lands
  - Developed/Disturbed
- Forest/Woodlands
  - Aspen
  - Forest-Other
  - Juniper and Mahogany Woodlands
  - Mixed Conifer Forest
  - Riparian Woodlands
- Grasslands
  - Native Grasslands
  - Non-native Grasslands
- Open Water
  - Open Water
- Riparian Conservation Areas
  - Riparian Conservation Areas
- Shrublands
  - Desert Shrub
  - Dwarf Sagebrush Steppe

- Mountain Shrub
- Shrubland-Other
- Tall Sagebrush Steppe

The Riparian Woodland and Shrubland-Other are very minor subtypes occurring as small, discontiguous patches generally less than one acre in extent. Although both community subtypes occur in the 1-mile study corridor for vegetation resources, no alternative routes considered for the B2H Project cross either subtype. As such, impacts on these vegetation community subtypes are not expected and neither vegetation community subtype is discussed further in Sections 3.2.3.4 and 3.2.3.6.

The Mixed Conifer Forest vegetation community subtype may contain areas that display old-growth forest characteristics. Data identifying areas with old-growth characteristics is not available for all alternative routes considered for the B2H Project, therefore impacts on forests with old-growth characteristics is described qualitatively in 3.2.3.6. Additional information about potential effects of the B2H Project on old-growth forests in areas under USFS jurisdiction is presented in Section 3.4.

Due to the scale and complexity of the B2H Project, RCAs were used to define and analyze impacts on wetlands and riparian resources. RCAs encompass traditional riparian corridors, wetlands, intermittent streams, and waterbodies, as well as upland areas that maintain the integrity of aquatic ecosystems by: (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams; (2) providing root strength for channel stability; (3) shading streams; and (4) protecting water quality. In addition, riparian-associated plants and animals rely on these areas for critical life functions (e.g., reproduction) and to provide connectivity and dispersal corridors. RCAs are considered portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines (USFS and BLM 1995) and are consistent with the Decision Notices for Pacific Anadromous Fish Strategy (PACFISH) and Inland Native Fish Strategy (INFISH), the Updated Interior Columbia Basin Strategy, and the proposed federal agency RMPs covering lands within the vegetation resources study corridor.

RCAs were defined as areas occurring within specified distances from streams, wetlands, and waterbodies (Table 3-93). The RCA widths listed in Table 3-93 are based on those recommended in PACFISH. The 2014 Updated Interior Columbia Basin Strategy concluded that RCA widths and delineation criteria prescribed in PACFISH and INFISH would be sufficient to provide for riparian function (Quigley and Arbelbide 1997). For some sites within the 1-mile analysis corridor, the default RCA widths may be greater or less than needed for protection of associated aquatic and riparian systems. However, for purposes of consistency in analysis of B2H Project effects, the default RCA widths were applied.

Table 3-93. Riparian Conservation Area Widths

Category	Category Type	Riparian Conservation Area Default Width[1]
1	Fish-bearing streams	**300 feet** slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest
2	Perennial non-fish-bearing streams	**150 feet** slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest
3	Ponds, lakes, reservoirs, and wetlands greater than 1 acre	**150 feet** slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs, or from the edge of the wetland, from the edge of the pond or lake, or to the extent of additional delineation criteria, whichever is greatest
4	Intermittent or seasonally flowing streams[2] and wetlands less than 1 acre	In watersheds that support ESA-listed fish species or critical habitat, or both, **100 feet** slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest In watersheds that do not have current documented presence of ESA-listed fish species or critical habitat, or both, **50 feet** slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest

Table Notes:

[1]For the Environmental Impact Statement analysis, Riparian Conservation Areas were delineated using horizontal straight line distance rather than slope distance. Slope distances will be used in B2H Project implementation.

[2]For the Environmental Impact Statement Analysis, intermittent or seasonally flowing stream data were included only if they intersected land cover types associated with aquatic features.

The presence of fish species within fish-bearing streams was determined using StreamNet datasets for redband trout, bull trout, steelhead trout, and Chinook and Coho salmon. Perennial, intermittent, and seasonally flowing streams, as well as ponds, lakes, and reservoirs, were identified using the NHD. For this analysis, all perennial streams identified by the NHD were considered fish-bearing and delineated as a Category 1 RCAs.

For this analysis, RCAs were delineated using horizontal straight line distances from each water feature rather than the slope distances indicated in Table 3-93. Local fine-scale topographic data, which were not available for the vegetation resources study corridor at the time of document development, are necessary to accurately measure slope distance. The use of horizontal straight line buffer distances assumes the greatest buffer length possible and conservatively estimates the extent of RCAs in the vegetation resources study corridor. Characterization of RCAs during B2H Project implementation will be based on slope distances.

For this analysis, RCAs associated with intermittent or seasonally flowing streams were identified as the intersection of the intermittent and ephemeral streams from the NHD and land cover types associated with aquatic features from the NWGAP dataset. The RCAs at these intersections were delineated using 50-foot or 100-foot horizontal straight line distances, depending on the presence of ESA-listed fish species. This approach was taken to more accurately represent the extent of aquatic ecosystems in the B2H Project area. Delineating RCAs as all areas within 50 or 100 feet of the intermittent or ephemeral streams included in the NHD vastly overestimates the extent of aquatic ecosystems in the B2H Project area. Any use of RCAs during B2H Project implementation will be consistent with the conditions set in PACFISH and INFISH.

RCAs approximate the areas of aquatic ecosystems, vegetation communities dependent on aquatic ecosystems, and upland vegetation influencing the aquatic ecosystems. They do not represent specific aquatic features, including jurisdictional wetlands. Specific aquatic features present in the B2H Project area and potential impacts on these features resulting from B2H Project activities are discussed in the Section 3.2.2.

IDENTIFICATION OF FEDERALLY LISTED AND SENSITIVE PLANT SPECIES IN THE B2H PROJECT AREA

Federally listed species are those listed as endangered or threatened, are proposed to be listed, or are candidates for review. In response to a request from the BLM, the USFWS provided information from its Endangered Species Program on plant species that may occur in the B2H Project area or may be affected by the B2H Project (USFWS 2016), or both. After considering the ranges, distributions, and habitats of the species provided by the USFWS, it was determined that one plant species, Howell's spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*), listed as threatened occurs within the special status plant species study corridor and could potentially be affected by the B2H Project. A detailed description of Howell's spectacular thelypody is included in Appendix D. Updates to the federally listed species potentially occurring in the B2H Project area are checked regularly using the Information for Planning and Conservation database (USFWS 2016).

Several plant species identified by the USFWS as potentially occurring in the B2H Project area or that may be affected by the B2H Project were not carried forward for analysis in this EIS. These species include northern wormwood (*Artemisia campestris* var. *workskioldii*), Macfarlane's four-o'clock (*Mirabilis macfarlenei*), Spalding's catchfly (*Silene spaldingii*), whitebark pine (*Pinus albicaulis*), and slickspot peppergrass (*Lepidium papilliferum*) (USFWS 2016). Northern wormwood was not carried forward because the species is not known in proximity to any alternative route, known habitat in the floodplain of the Columbia River would not be affected by the B2H Project (USFWS 2013), and the species is considered extirpated from Oregon (USFWS 2013). Spalding's catchfly and Macfarlane's four-o'clock were not carried forward due to their known ranges being restricted to northeastern basins of the Wallowa Mountain Range and the Snake River Canyon, neither of which is crossed by any alternative route, nor are occurrences known in the special status plants study corridor for any alternative route. Whitebark pine was not carried forward for analysis despite the known range, including the B2H Project area, because mapped habitat does not occur in the special status plants study corridor and B2H Project-related impacts are not expected in the high-elevation ridges typical of whitebark pine habitat (Aubry et al. 2008). Slickspot peppergrass was not carried forward for similar reasons, neither known occurrences nor proposed critical habitat exist in the special status plants study corridor for any alternative route (FR Doc. 2014-03134).

Sensitive species include those listed by the BLM and USFS as sensitive, or listed by Oregon as endangered or threatened. A preliminary list of sensitive plant species potentially occurring within the 10-mile analysis corridor for special status plant species was developed based on (1) state lists of state endangered and threatened species in Oregon (ODA 2014); (2) BLM statewide lists of sensitive plant

species (BLM 2016; ISSSSP 2015a); and (3) the USFS Region 6 list of sensitive species (ISSSSP 2015b). In addition to vascular plants, these lists include bryophytes, lichens, and fungi.

The preliminary special status plant species list was narrowed to a list of special status species likely to occur in the B2H Project area by identifying special status species with documented occurrences in the 10-mile-wide special status plant species analysis corridor. The 10-mile-wide corridor was chosen to account for both uncertainties in the spatial information of the documented occurrences and the possibility of undocumented occurrences existing in the right-of-way. Potential synonymy between the lists and the occurrence data was corrected by using the accepted scientific name from the taxonomic authority, the Integrated Taxonomic Information System.

Special status species occurrence data was compiled from several datasets, including GeoBOB (BLM), NRM TESP-IS (USFS), IFWIS (IDFG), ORBIC (Institute for Natural Resources), and preconstruction surveys (Tetratech). Preconstruction surveys for special status plant species were conducted for the B2H Project from 2011 to 2014. However, because the alignments of several alternative routes were revised between the Draft and Final EIS, results of the preconstruction surveys do not fully represent the distribution of special status plant in the B2H Project area.

Because special status plant occurrences were compiled from several sources and some of the datasets contained data that overlapped with data from other sources, numerous occurrences were duplicated when the data were compiled. In the 10-mile special status species analysis corridor, duplicate occurrences were identified and eliminated from consideration in the analysis. In general, preference was given to the more recent occurrence mapped at a finer scale. Where several smaller occurrences were mapped as a single occurrence by another source, preference was given to the larger, more inclusive occurrence. Duplicate occurrences were not identified and eliminated across the entire range of the species; therefore, estimates of total occurrences in this analysis likely represent an overestimation. Additionally, the occurrences known from Idaho were determined from a subset of the IFWIS dataset which included only occurrences in the 16-mile B2H Project area; thus, the number of known occurrences is likely an underestimation of the number of occurrences in Idaho. The total number of occurrences reported for the ORBIC and IFWIS datasets in this analysis was determined without using a separation distance and may differ slightly from the total occurrences reported by ORBIC or IFWIS in their ranking documents. The initial list of sensitive plant species identified using occurrence data was further refined by consulting with agency personnel. The refined sensitive species list includes 42 species known to occur in the 10-mile-wide special status plant species analysis corridor. Species accounts, including habitat requirements, known distribution, recent and historical observations, and the likelihood of occurrence in the special status plant species analysis corridor, were prepared for special status species and are presented in Appendix D.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Impacts

The criteria used to assess impacts were developed collaboratively with the cooperating agencies to assess the level of potential impacts on vegetation resources associated with B2H Project

implementation and allow comparison among alternative routes. Impact criteria were determined with consideration of relative abundance and importance of the vegetation resources, the nature and magnitude of expected impacts, length of time needed to recover from disturbance, and federal and state laws protecting resources. Table 3-94 summarizes the criteria used to assess impacts on vegetation resources.

Table 3-94. Criteria for Assessing Level of Initial Impacts on Vegetation Resources

Level of Impacts	Description
High	• Mortality of a federally endangered, threatened, or candidate plant species • Loss or adverse modification to habitat occupied by federally endangered, threatened, or candidate plant species • Irreversible or difficult to reverse modification of vegetation communities that are rare, regenerate slowly, and would require substantial modification of vegetation during construction • Loss or adverse modification of vegetation communities crucial for ecosystem function and biodiversity • Mortality of agency sensitive or state endangered or threatened plant species resulting in the extirpation of a local population trending the species toward listing under the ESA • Loss or irreversible modification of sites or areas culturally important for the gathering of traditional foods or other ethnobotanical resources
Moderate	• Loss or adverse modification of uncommon native vegetation communities • Mortality of agency sensitive or state endangered or threatened plant species contributing to the extirpation of local populations but not trending the species toward listing under the ESA • Long-term disturbance to agency sensitive and state endangered or threatened plant species • Disturbance of common native vegetation communities that regenerate slowly • Short-term disturbance to rare vegetation communities • Disturbance to native vegetation communities that results in the long-term reductions in the availability of traditional foods or other ethnobotanical resources
Low	• Short-term disturbance of agency sensitive; state endangered or threatened; or federally endangered, threatened, or candidate plant species • Limited or incidental mortality of agency sensitive; state endangered or threatened plant species that does not result in population- or species-level effects • Short-term disturbance of uncommon native vegetation communities • Loss, adverse modification, or disturbance of common vegetation communities • Loss, adverse modification, or disturbance of vegetation communities that regenerate rapidly or are not a component of the natural landscape • Disturbance to native vegetation communities that results in short-term reductions in the availability of traditional foods or other ethnobotanical resources

Effects Analysis

Assessment of Initial Impacts

Initial impacts are those effects resulting from the implementation of the B2H Project, with consideration of the design features B2H Project for environmental protection. These design features would be implemented throughout the B2H Project and are expected to reduce initial impacts on vegetation resources. Initial impacts on vegetation resources were assigned using the criteria for assessing impacts identified in Table 3-94. A list and description of all B2H Project design features is provided in Table 2-7. The design features relevant to vegetation resources are summarized below.

- **Design Feature 1 (Plan of Development)**. A POD would be prepared for implementation and maintenance of the B2H Project to provide direction to the Applicant's construction personnel, construction contractors and crews, compliance inspection contractor (CIC), environmental monitors, and agency personnel regarding specification of construction; and provide direction to the agencies and Applicant's personnel for operation and maintenance of the B2H Project. The POD would contain implementation plans and detailed mapping to facilitate execution of environmental protection, mitigation measures, and conservation measures. Implementation plans (also refer to EIS Table 2-3) relevant to vegetation resources would include:
  - Environmental and Safety Training Plan
  - Environmental Compliance Management Plan
  - Biological Resources Conservation Plan
  - Noxious Weed Management Plan
  - Water Resources Protection Plan
  - Erosion, Dust Control, and Air Quality Plan
  - Reclamation, Revegetation, and Monitoring Framework Plan
  - Stormwater Pollution Prevention Plan
  - Spill Prevention, Containment, and Countermeasures Plan Framework
  - Fire Protection Plan
  - Vegetation Management Plan

  The Noxious Weed Management Plan establishes an adaptable plan where the results of preconstruction surveys will determine the types and extent of weed-control methods. Postconstruction monitoring will determine the effectiveness of weed-control measures and determine where additional control would be required. The Applicant is responsible for ensuring that all federal, state, county, and other local agreements are satisfied. Application of the Noxious Weed Management Plan is expected to identify areas infested by invasive plants, control infestations, and prevent the further spread and establishment of invasive plants.
- **Design Feature 2 (Environmental Training for All Personnel)**. Prior to construction, the CIC would instruct all personnel on the protection of ecological and natural resources, such as (a) federal and state laws regarding special status plants, including collection and removal; (b) the importance of ecological and natural resources; (c) the purpose and necessity of protecting ecological and natural resources; and (d) reporting and procedures for stop work. This design feature would minimize effects on special status plant habitats and populations.
- **Design Feature 4 (Preconstruction Surveys for Sensitive Species)**. Preconstruction surveys for special status species, threatened and endangered species, or other species of particular concern would be considered in accordance with the B2H Biological Survey Work Plan. In cases for which such species are identified, appropriate action would be taken to avoid adverse impacts on the species and its habitat. This design feature would minimize effects on special status plant habitats and populations.
- **Design Feature 5 (Spatial Extent of Construction Activities)**. The spatial limits of construction activities, including vehicle movement, would be predetermined with activity

restricted to and confined within those limits. This design feature would minimize effects on vegetation resources by restricting disturbance to a predefined extent.

- **Design Feature 6 (Reclaim Construction Areas)**. In construction areas (e.g., staging areas, material laydown yards, fly yards, and wire pulling/splicing sites) where there is ground disturbance and where recontouring is required, surface reclamation would occur as required by the Reclamation, Revegetation, and Monitoring Plan or the landowner. The method of reclamation may consist of, but may not be limited to, returning disturbed areas to their natural contour, reseeding, installing cross drains for erosion control, placing water bars in permanent roads, and filling ditches where they were installed for temporary roads. All areas disturbed as a part of the construction and/or maintenance of the proposed transmission line would be seeded with a seed mixture appropriate for those areas as identified in the Reclamation, Revegetation, and Monitoring Plan. The federal land-managing agency or landowner(s) would approve a seed mixture that is compatible with the affected Ecological Site Description.

  In construction areas where disturbing the existing contours is not required, vegetation would be left in place wherever possible, and original contours would be maintained to avoid excessive root damage and allow for resprouting in accordance with the Reclamation, Revegetation, and Monitoring Plan or landowner approval. This design feature would minimize effects on vegetation resources by preventing permanent loss of vegetation communities and reducing indirect effects associated with weed invasion and degradation of special status plant habitat.
- **Design Feature 7 (Salvage Topsoil for Revegetation)**. In work areas where ground-disturbing activities would occur, topsoil would be salvaged and segregated prior to construction, to be redistributed and contoured evenly over the surface of the disturbed area to be removed following completion of construction. The soil surface would be seeded with an agency- or landowner-approved seed mix and left rough to help reduce the potential for erosion and loss of seeded surface as specified in the reclamation plan. This design feature would minimize effects on vegetation communities by preserving the seedbank and preventing permanent loss of vegetation communities.
- **Design Feature 8 (Overland Travel in Construction Work Areas)**. Grading would be minimized by driving overland in areas approved in advance by the land-managing agency or land owner, or both, in predesignated work areas (e.g., staging areas, material laydown yards, fly yards, and wire pulling/splicing sites) whenever possible. This would minimize effects on vegetation resources by minimizing disturbance.
- **Design Feature 9 (Use of Access Routes Outside of Right-of-Way)**. All vehicle movement outside the right-of-way would be restricted to predesignated access, contractor-acquired access, public roads, or overland travel routes approved in advance by the applicable land-managing agency or landowner. This would minimize effects on vegetation resources by minimizing disturbance and reducing the potential of weed invasion.
- **Design Feature 15 (Reduce Impacts on Riparian Areas)**. Consistent with the BLM and USFS riparian management policies, surface-disturbing activities would be avoided in defined segments of RCAs, using the following delineation criteria, unless exception criteria defined by

the BLM are met or with agency approval of acceptable measures to protect riparian resources and habitats by avoiding or minimizing stormwater runoff, sedimentation, and disturbance of riparian vegetation, habitats, and wildlife species:

- Fish-bearing streams: 300 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest.
- Perennial non-fish-bearing streams: 150 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest.
- Ponds, lakes, reservoirs, and wetlands greater than 1 acre: 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond, or lake, or to the extent of additional delineation criteria, whichever is greatest.
- Intermittent or seasonally flowing streams and wetlands greater than 1 acre: In watersheds that support ESA-listed fish species or designated critical habitat, or both, 100 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest. In watersheds that do not have current documented presence of ESA-listed fish species and /or designated critical habitat, 50 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest.

Mitigation measures, such as micro-siting road locations, would be developed on a site-specific basis, in consultation and coordination with the BLM and other federal land-managing agencies, and incorporated into the POD. This would minimize effects on vegetation resources by minimizing disturbance to sensitive vegetation communities.

- **Design Feature 16 (Span Riparian Communities/Water Courses)**. Based on biological resources surveys and results of Section 7 consultation, state and federally designated sensitive plants, habitat, wetlands, riparian areas, springs, wells, water courses, or rare/slow regenerating vegetation communities would be flagged and structures would be placed to allow spanning of these features, where feasible, within the limits of standard structure design. This would minimize effects on vegetation resources by minimizing disturbance to sensitive vegetation communities.
- **Design Feature 17 (Work during Wet Periods)**. If work were required during wet periods with saturated soil conditions, vehicles would not be allowed to travel when soils are moist enough for deep rutting (4 or more inches deep) to occur unless prefabricated equipment pads (matting) was installed over the saturated areas or other measures were implemented to prevent rutting. Equipment with low-ground-pressure tires, wide tracks, or balloon tires would be used when possible. This would minimize effects on sensitive vegetation resources by reducing soil disturbance or alterations to hydrologic regimes.
- **Design Feature 20 (Reduce Potential for Aquatic Invasive Species)**. Interagency-developed methods of avoidance, inspection, and sanitization as described in the *Operational Guidelines for Aquatic Invasive Species Prevention and Equipment Cleaning* (USFS 2009b) would be adhered to. If control of fugitive dust near sensitive waterbodies is necessary, water would be

obtained from treated municipal sources or drafted from sources known to contain no aquatic invasive species. Support vehicles, drill rigs, water trucks, and drafting equipment would be inspected and sanitized, as needed, following interagency-approved operational guidelines. This design feature would minimize effects on sensitive vegetation resources by reducing the potential for weed introductions to sensitive vegetation communities.

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection, selective mitigation measures would be applied where feasible to reduce potential impacts on vegetation resources or where required to comply with law, regulation, or agency policy. For any alternative route selected, the Applicant would coordinate with the BLM, other land-managing agencies, or private landowners, as appropriate, to refine the implementation of mitigation for vegetation resources at specific locations. A list and description of all selective mitigation measures is provided in (Table 2-13). The selective mitigation measures that would be applied to vegetation resources are summarized below:

- **Selective Mitigation Measure 2 (Use Existing Access or Stream Crossings, or both, for Sensitive Resources Avoidance)**. Existing access or stream crossings, or both, would be used as much as possible or practicable for construction and maintenance to avoid disturbance of sensitive resources crossed by the B2H Project. Where applied, this measure is expected to reduce impacts on sensitive vegetation communities by limiting disturbance associated with new access roads.
- **Selective Mitigation Measure 3 (Use of Matting [Stabilization] in Sensitive Resource Areas)**. To minimize ground disturbance in sensitive vegetation areas, matting or another similar practice for ground stabilization could be used for B2H Project access and work areas. Where applied, this measure is expected to reduce impacts on sensitive vegetation communities by limiting soil disturbance that could result in alterations to hydrologic regimes or noxious weed invasion.
- **Selective Mitigation Measure 5 (Minimize Vegetation Clearing for Operational Clearances)**. Removal of vegetation in the right-of-way would be minimized to limit disturbance to timber resources and slow-growing vegetation communities and to protect sensitive habitat that is subject to structure- and conductor-clearance requirements. Trees and other vegetation would be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate. Where applied, this measure is expected to reduce impacts on slow-growing vegetation communities by limiting clearing and disturbance of slow-growing vegetation.
- **Selective Mitigation Measure 8 (Span or Avoid Sensitive Features)**. Within the limits of standard tower design, structures would be located to allow conductors to avoid identified sensitive features, such as special status plant species and habitats. This could be accomplished through methods such as selective tower placement, spanning sensitive features, or realigning the B2H Project centerline (micro-siting). Application of this selective mitigation measure is expected to limit disturbance to and reduce impacts on special status plants.

- **Selective Mitigation Measure 13 (Spatial Plant Restrictions)**. To minimize disturbance to identified plant species, construction, operation, and maintenance activities would be restricted in designated areas unless exceptions are granted by the authorized officer or his/her designated representative and other applicable regulatory agencies (e.g., the USFWS or state wildlife agencies). Application of this selective mitigation measure is expected to limit disturbance to and reduce impacts on special status plants.

Residual Impacts

Residual impacts are the impacts on resources anticipated to occur from B2H Project activities after the application of selective mitigation measures described in the Mitigation Planning and Effectiveness section. The application of selective mitigation measures is anticipated to reduce the level of residual impacts associated with B2H Project construction and maintenance from the initial levels. The level of anticipated residual impacts on vegetation resources was assessed using the criteria presented in Table 3-94.

Vegetation Communities

Table 3-95 summarizes the level of anticipated initial and residual impacts on vegetation communities, as well as the relevant design features and selective mitigation measures. The level of impacts on vegetation communities are quantified and reported as a function of miles crossed of mapped vegetation communities.

Table 3-95. Summary of Initial and Residual Impact Levels For Vegetation

Common Name	Design Features of the B2H Project for Environmental Protection	Initial Impact	Selective Mitigation Measures	Residual Impact
Native Grasslands	2, 5, 6, 7, 8, 9	Moderate	None	Moderate
Non-native Grasslands	2, 5, 6, 7, 8, 9	Low	None	Low
Desert Shrub	2, 5, 6, 7, 8, 9	Moderate	None	Moderate
Dwarf Sagebrush Steppe	2, 5, 6, 7, 8, 9	Moderate	None	Moderate
Tall Sagebrush Steppe	2, 5, 6, 7, 8, 9	Moderate	None	Moderate
Mountain Shrub	2, 5, 6, 7, 8, 9	Moderate	None	Moderate
Mixed Conifer Forest	2, 5, 6, 7, 8, 9	Moderate	5	Moderate
Aspen	2, 5, 6, 7, 8, 9	Moderate	5	Moderate
Juniper and Mahogany Woodland	2, 5, 6, 7, 8, 9	Moderate	5	Moderate
Bare Ground, Cliffs, and Talus	2, 5, 6, 8, 9	Low	None	Low
Agriculture	2, 5, 6, 7, 8, 9, 36	Low	None	Low
Developed/Disturbed	2, 5, 6, 7, 8, 9	Low	None	Low
Riparian Conservation Area	2, 5, 6, 7, 8, 9, 15, 16, 17, 20	High	2, 3, 5	Moderate
Forest – Other	2, 5, 6, 7, 8, 9	Low	None	Low
Open Water	2, 5, 6, 7, 8, 9	Low	None	Low

Federal Listed, Candidate Plant Species, and Other Sensitive Plant Species

The level of initial and residual impacts on special status plant species were not assessed quantitatively due to data limitations. The level of initial impacts, the application of selective mitigation measures, and the anticipated residual impacts will be discussed qualitatively for special status plant species.

Additional Analysis

In addition to the assessment of residual impacts on vegetation resources, the extent of disturbance to vegetation communities was estimated based on the B2H Project description. Prior to final engineering design, the location of B2H Project features, such as new access roads, upgrades to existing roads, overland travel areas, transmission line structures, or other B2H Project facilities, are not identified. The total extent of disturbance (in acres) due to construction of features such as the access network (construction of new roads, upgrades to existing roads, and overland travel), transmission line structures, and other B2H Project facilities was estimated over the entire length of an alternative route using the access model developed for the B2H Project and the Applicant's B2H Project description (refer to Chapter 2, Section 2.5.1). Disturbance associated with the construction of the B2H Project was assumed to occur at a constant density per mile of transmission line and was calculated for each alternative route based on the total estimated disturbance and total length of each alternative route. The estimated density of disturbance (in acres per mile) for each alternative route was used to calculate the extent of disturbance on vegetation communities (in acres) that could occur for each specific length of vegetation community crossed by an alternative route.

B2H Project impacts on federally listed, candidate, sensitive, and other plant species were considered using known occurrence data compiled from several different sources. Locations of known occurrences of special status plants in the 10-mile-wide special status plant species analysis corridor and the 1-mile vegetation resources analysis corridor were identified by segment for each alternative route. The jurisdiction of special status species occurrences in the 1-mile vegetation resources corridor and the state natural heritage ranking for each species also were determined. The number of occurrences by jurisdiction was considered in the analysis due to the lack of reliable survey data and legal protection for occurrences on private lands. Oregon State threatened and endangered plants have some protection on private land while BLM and Forest Service sensitive plants are not protected on private land unless they are also listed as Oregon threatened and endangered. Any potential B2H Project effect on occurrences of sensitive plant species on private land may have an outsized impact, depending on pre-existing disturbance or individual landowner preferences regarding survey access or herbicide application during B2H Project construction, operation, and maintenance. This information guided the qualitative analysis of B2H Project impacts on the species using the criteria presented in Table 3-94.

Noxious weeds are plants considered by a governmental organization to be injurious to public health, agriculture, recreation, environment, or property. Most plants designated as noxious weeds are non-native, but some designated noxious weeds are native plant species. Several plant species, such as cheatgrass or bulbous bluegrass, are capable of invading native vegetation communities and displacing native plant species, but are not designated as noxious weeds. In this analysis, the broader term

invasive plants is used to describe all non-native plants that may adversely affect vegetation communities, and the more specific term noxious weeds is used to describe plant species designated by the states of Oregon and Idaho, as well as Baker, Union, Morrow, Umatilla, and Malheur counties in Oregon.

The presence and threat of noxious weed invasion was determined for each B2H Project segment using a desktop analysis identifying groupings of known weed locations in the B2H Project area, as well as areas with few known weed locations. This desktop analysis guided the qualitative analysis of B2H Project impacts related to increased risk of weed invasion. The known weed locations were determined from the most current datasets available from the BLM, USFS, and ODA.

Because the NWGAP datasets used to analyze impacts on vegetation communities do not contain information about several large wildfires that burned in 2015, fire boundary data were obtained from the Geospatial Multi-Agency Coordination Group (USGS 2015). Wildfire boundaries were used to identify the extent of the fires and determine which alternative routes cross recently burned areas. Wildfire boundaries also were used in the qualitative analysis of B2H Project impacts on recently burned areas and fire regimes. The quantitative analysis for vegetation communities assumes recently burned areas will recover to the pre-existing vegetation communities. Recovery from wildfires depends on the amount of time since the occurrence, precipitation amounts, vegetation community type, degree of associated degradation (weed invasion, soil loss, and alteration of community structure), and amount of reclamation effort by the land-managing agencies.

Potential B2H Project impacts on areas supporting traditional foods and ethnobotanical resources, availability of these resources, and changes in accessibility were analyzed in the context of the vegetation communities defined by the NWGAP dataset. This approach was taken due to the variety of these resources and the habitats supporting them, as well as to avoid disclosing locations of traditional food gathering areas, which often have cultural, historic, and spiritual importance.

To satisfy USFS requirements set in USFS Manual 2672 regarding biological evaluations and the "concerns for sensitive species throughout the planning process, identifying opportunities for enhancement and reducing any potentially negative impacts", the distribution, potential impacts, and mitigation of potential impacts of the B2H Project on USFS sensitive plant species on USFS-administered land are discussed under a separate subheading in each segment.

3.2.3.5 Affected Environment

Regional Setting

The B2H Project is situated in four level III ecoregions: the Columbia River Basin, Blue Mountains, Northern Great Basin, and Snake River Floodplain (EPA 2013). Ecoregions are distinguished from each other by the patterns and composition of biotic and abiotic characteristics, including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology (Omernik 1987, 1995). Table 3-96 summarizes the distribution of the four ecoregions in the B2H Project area.

Table 3-96. Distribution of Ecoregions in the B2H Project Area

Segment	Ecoregion
1	Columbia Plateau
2	Blue Mountains
3	Blue Mountains
4	Blue Mountains Northern Basin and Range Snake River Plain
5	Northern Basin and Range Snake River Plain
6	Northern Basin and Range Snake River Plain

The Columbia Plateau ecoregion covers central and southeastern Washington and north-central Oregon and is characterized by broad expanses of semi-arid sagebrush-covered volcanic plains and valleys. This ecoregion is influenced heavily by the presence of the Columbia River, and ecological processes over time have created deep soils that are highly suited for agricultural use. Historically, vegetation in this ecoregion was dominated by grassland and shrub-steppe, but the majority of the area has since been converted to agricultural use and pasturelands. In fact, most of Oregon's grain production is in this ecoregion.

The Blue Mountains ecoregion encompasses much of northeastern Oregon and is characterized by steep to rolling mountain habitat; vegetation ranges from shrubland- to bunchgrass-dominated grasslands to conifer-dominated woodlands. The area of the Blue Mountains ecoregion in the 1-mile-wide vegetation resources analysis corridor is a low, open complex of mountains substantially vegetated with coniferous forests. Snow accumulates to depths of 3 to 6 feet in the winter in this area due to its higher elevation.

The Northern Basin and Range ecoregion is located in southeastern Oregon and southwestern Idaho. Sagebrush dominates the landscape in this arid ecoregion, and its topography consists of flat basins, isolated mountain ranges, and basalt cliffs. The primary land use for this ecoregion is range and pastureland.

The Snake River Plain ecoregion extends across southern Idaho into eastern Oregon. Sagebrush steppe was historically the dominant vegetation type in this ecoregion; scattered barren lava fields and saltbush (*Atriplex canescens*)-greasewood (*Sarcobatus vermiculatus*) communities also are present. The availability of water for irrigation has resulted in the conversion of a large percentage of the alluvial valleys bordering the Snake River to agricultural use, while most of the surrounding plains and low hills are used for livestock grazing.

VEGETATION COMMUNITIES

There are 80 ecological systems identified by the NWGAP dataset that exist in the 1-mile-wide vegetation resources analysis corridor (USGS 2011). These ecological systems were reclassified into 17 vegetation community subtypes and 8 primary vegetation communities. Each primary vegetation

community, vegetation community subtype, and the associated ecological systems are described below. The vegetation community and ecological system descriptions are adapted from the ODFW Conservation Strategy habitat types and from NatureServe's Ecological System classification descriptions, respectively (NatureServe 2012; ODFW 2006). The classification of primary vegetation communities, subtypes, and ecological systems is summarized in Table D-2 in Appendix D. The distribution of the vegetation community subtypes across the B2H Project area is displayed on MV-7.

Agriculture

Agricultural areas within Oregon and Idaho vary annually in composition. Major crops produced in this area include wheat, barley, alfalfa, hay, potatoes, onions, sugar beets, carrots, and corn. Cultivated croplands and modified grasslands are plowed and harvested seasonally, while pastures are mowed, hayed, or grazed one or more times a year. The agricultural land cover within the B2H Project area includes irrigated agriculture, dryland farming, dairy operations, and grazing pastures on private lands.

The Agriculture community subtype is discussed and analyzed as a landcover type in this section of the EIS. A more detailed analysis of B2H Project impacts on agricultural land, activities, and production is contained in Section 3.2.7.

Bare Ground, Cliffs, and Talus

Bare Ground, Cliffs, and Talus vegetation communities are sparsely vegetated areas where the predominant habitat features are more related to geologic substrates than vegetation components. These areas, especially cliffs and Talus fields, are essential habitat features for many animal species that use them for nesting substrate or hiding cover. Cliffs provide rock crevices and ledges raised above the ground, away from predators and somewhat protected from the elements. Talus fields extend out from below cliff faces and steep slopes, providing hiding cover and microhabitat conditions. Many special status plant species present in the B2H Project area occur in these sparsely vegetated communities.

Developed/Disturbed

The Developed/Disturbed land cover typically results from the complete conversion of a site or an area from its natural condition. Developed areas typically contain non-native vegetation in the form of landscaping around buildings and homes, as well as weed lots with invasive plants that have become established in disturbed landscapes. Nevertheless, scattered and isolated blocks of native or non-native vegetation may remain in Developed/Disturbed areas, and wildlife species that are more tolerant of human activity may use these areas (e.g., greenbelts, parks, and backyards). Throughout the B2H Project area, Developed/Disturbed communities are primarily associated with rural residences and agricultural operations.

Forests/Woodlands

Forests/Woodland communities are found throughout the B2H Project area. Forests/Woodlands are the most dominant vegetation communities found in the Blue Mountains ecoregion, with Juniper and

Mahogany Woodlands occurring primarily in the Northern Basin and Range and the Snake River Plain ecoregions. The following Forests/Woodlands subtypes occur within the B2H Project vegetation resources analysis corridor:

Aspen

The Aspen subtype is found in montane and subalpine zones. This subtype is dominated by quaking Aspen and lacks a significant conifer component (CNHP 2005). This subtype provides an important wildlife habitat and occurs in portions of the B2H Project area in the Blue Mountains region.

Forest-Other

The Forest-Other community subtype includes Harvested Forest, Introduced Upland Vegetation–Treed, and Recently Burned Forest ecological systems. In general, this subtype represents other Forests/Woodlands vegetation communities that have been altered by fire or anthropogenic disturbance. The assemblage of species found in this subtype varies greatly depending on original vegetation community, extent of disturbance, and time since disturbance. In the vegetation resources study corridor, Forest-Other is a minor subtype occurring as small, discontiguous patches generally less than 20 acres in extent.

Juniper and Mahogany Woodland

The Juniper and Mahogany Woodland subtype includes western juniper and mountain mahogany woodland communities. Western juniper woodlands in the vegetation resources study corridor is composed of widely spaced western juniper trees, a discontinuous shrub layer, and an herbaceous layer dominated by grasses. These woodlands occur in a very dry zone located between the shrub-steppe and ponderosa pine forests. Western juniper is the dominant tree species and dominant shrubs may include big sagebrush, antelope bitterbrush, rubber rabbitbrush, and wax currant (*Ribes cereum*). The herbaceous layer is dominated by bluebunch wheatgrass and Idaho fescue (Franklin and Dyrness 1988). The mountain mahogany community is described by Franklin and Dyrness (1988) as a transition zone between the lower edge of ponderosa pine communities and the upper edge of the sagebrush-dominated shrub-steppe communities. This community is dominated by curl-leaf mountain mahogany with scattered ponderosa pine and western juniper as well. The understory is dominated by big sagebrush and yellow rabbitbrush.

Mixed Conifer Forest

The Mixed Conifer Forest subtype is very diverse, comprising several tree species in differing compositions, including, grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), western larch (*Larix occidentalis*), subalpine fir (*Abies lasiocarpa*), ponderosa pine (*Pinus ponderosa*), and lodgepole pine (*Pinus contorta*) (Franklin and Dyrness 1988).

Typical compositions include mixed grand fir/Douglas-fir (and mixed tamarack [*Larix spp.*]). Mixed grand fir/Douglas-fir communities occur in the Blue Mountains and are the most common forest composition found within the B2H Project area. Douglas-fir typically dominates at middle elevations but

is replaced by subalpine fir at higher elevations and ponderosa pine or big sagebrush at lower elevations (Franklin and Dyrness 1988). NatureServe (2013) describes this vegetation community subtype as a seral matrix of large patches dominated or codominated by one, or combinations, of the above species. Grand fir (a fire-sensitive, shade-tolerant species) has increased on many sites once dominated by Douglas-fir and ponderosa pine due to fire regime changes. Western larch can form homogenous stands consisting entirely of itself, especially after fires, but other tree species typically can be found co-occurring with western larch, including Douglas-fir, ponderosa pine, grand fir and lodgepole pine (Franklin and Dyrness 1988). At higher elevations, dominant tree species within the Mixed Conifer Forest subtype include subalpine fir, Engelmann's spruce (*Picea engelmannii*), mountain hemlock (*Tsuga mertensiana*) and lodgepole pine. However, these species typically dominate at elevations higher than those found in the B2H Project area.

Sites dominated by a single species include those composed of ponderosa pine and lodgepole pine. Sites dominated by ponderosa pine typically occur as open woodland and contain a variety of common tree species that vary based on elevation and moisture regime, including Douglas-fir, grand fir, lodgepole pine, western larch, western juniper, and quaking Aspen (*Populus tremuloides*) (Franklin and Dyrness 1988). These sites are common in much of the Blue Mountains.

Recently disturbed sites are often dominated by lodgepole pine, but lodgepole pine dominates at other sites, typically broad level pumice flats. Where conditions allow, lodgepole pine is the dominant tree species at these sites and occurs in pure or near pure stands, regardless of the seral stage. Lodgepole pine is capable of growing throughout a wide range of moisture regimes from the edge of the shrub-steppe zone to seasonally flooded wetlands; thus, understory vegetation widely varies with the corresponding moisture regime (Franklin and Dyrness 1988).

Riparian Woodlands

The Riparian Woodlands subtype includes vegetation communities dominated by trees and shrubs typical of riparian areas, but not contained in defined RCAs. These communities occur throughout the B2H Project area, usually as small patches at upper elevations. Riparian Woodlands in the B2H Project area are highly variable with varying cover amounts of tree, shrub and graminoid-dominated understories (NatureServe 2012). In addition to the varying amount of cover, Riparian Woodland species composition changes based on ecoregion and surrounding vegetation. Common tree species include cottonwoods (*Populus spp.*) and conifers like ponderosa pine or Douglas-fir. Commons shrub species include willow (Salix spp.), alder *(Alnus* spp) and red-osier dogwood (*Cornus sericea*). The understory is often dominated by several species of sedges, grasses or rushes (NatureServe 2012).

Riparian Woodlands is a very minor subtype occurring as small, discontiguous patches generally less than one acre in extent. Although the Riparian Woodlands community subtype does occur in the 1-mile study corridor for vegetation resources, no alternative routes considered for the B2H Project cross this subtype. As such, impacts on this vegetation community are not expected and the Riparian Woodlands vegetation community is not discussed further in Sections 3.2.3.4 and 3.2.3.6.

Grasslands

Grassland communities occur throughout the B2H Project area and typically are upland areas dominated by annual or perennial grasses with low shrub or tree cover. Dominant species depend on elevation, soil type, and ecoregion. Agricultural conversion and non-native species have degraded Native Grasslands throughout the region. Periodic fire, soil disturbance by rodent species, and wind all play important roles in maintaining Native Grasslands (ODFW 2006). The following Grassland community subtypes occur within the B2H Project 1-mile-wide vegetation resources analysis corridor:

Native Grasslands

The Native Grassland subtype is no longer common (except near timberline) in eastern Oregon or southwestern Idaho (ODFW 2006). Extensive agricultural conversion and invasion by annual grass species has replaced much of the Native Grassland subtype in the B2H Project area. Degraded soil conditions and short fire-return intervals may prevent Native Grasslands from transitioning into a shrub-dominated community, although they typically have some shrub component (Franklin and Dyrness 1988). Perennial bunchgrasses, such as Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*Pseudoroegneria spicata*), usually dominate this subtype. The classification of Native Grasslands depends on composition of associated herbaceous species, making this a difficult community subtype to photo-interpret, classify, and map.

Non-Native Grasslands

The Non-native Grassland subtype usually is dominated by cheatgrass, an invasive annual. Other invasive grasses include the annuals medusahead and wire grass (*Ventenata dubia*) and the invasive perennials bulbous bluegrass (*Poa bulbosa*), Kentucky bluegrass (*Poa pratensis*), and intermediate wheatgrass (*Thinopyrum intermedium*) (Harrison et al. 1996; Miller et al. 2013). Non-native Grasslands have extensively replaced native plant communities throughout the region and the B2H Project area.

Open Water

The Open Water community subtype includes areas classified as an Open Water (fresh) ecological system that are not included in RCAs. In general, this community subtype is associated with Agriculture and Developed/Disturbed vegetation communities where irrigation and runoff result in temporary ponding. In the vegetation resources study corridor, Open Water is a minor subtype occurring adjacent to Agriculture or Developed/Disturbed vegetation communities.

Riparian Conservation Areas

RCAs represent the vegetation communities existing near, or within, aquatic ecosystems. The exact community and assemblage of species depend on the type of aquatic ecosystem. In the B2H Project area, RCAs are likely to include riparian corridors dominated by cottonwoods (*Populus* spp.) and willows (*Salix* spp.), wet meadows dominated by sedge (*Carex* spp.) and grasses, or waterbodies dominated by aquatic species in Open Water habitats with emergent vegetation like cattail (*Typha* spp.) or bulrush (*Schoenoplectus* and *Scirpus* spp.) occupying the margins, and other wetlands.

RCAs also include a significant component of upland vegetation, which varies depending on the buffer distance used to determine the RCA. The upland vegetation captured in an RCA influences the nearby aquatic ecosystem by regulating the delivery of coarse sediment, organic matter, and woody debris to streams; providing root strength for channel stability; shading streams; and protecting water quality. The upland vegetation community and assemblage of species depend on the adjacent vegetation communities.

RCAs approximate the areas of aquatic ecosystems, vegetation communities dependent on aquatic ecosystems, and upland vegetation influencing the aquatic ecosystems. They do not represent specific aquatic resources (e.g., jurisdictional wetlands). Specific aquatic features, including wetlands, present in the B2H Project area and potential impacts on these features resulting from B2H Project activities are discussed in the Section 3.2.2.

Shrublands

Shrubland communities dominate much of the landscape in the vegetation resources study corridor. These communities differ in structure and species composition depending on the ecoregion, elevation, soil conditions, moisture regimes, and fire history of the area. However, they typically occur on dry flats and plains, rolling hills, saddles, and ridges where precipitation is low. They are dominated by shrub species with components of forbs and grasses. Historically, fire has played an important role in maintaining these communities and has served as a cyclical disturbance regime (ODFW 2006). The following Shrubland community subtypes occur within the B2H Project vegetation resources study corridor:

Desert Shrub

Desert Shrub communities in the B2H Project area are characterized by saline soils that support desert shrubs, including shadscale (*Atriplex confertifolia*), greasewood (*Sarcobatus vermiculatus*), bud sage (*Picrothamnus desertorum*), winterfat (*Krascheninnikovia lanata*), and hop sage (*Grayia spinosa*), as well as grasses, such as inland salt grass (*Distichlis spicata*) and basin wildrye (*Leymus cinereus*) (Franklin and Dyrness 1988). The Desert Shrub subtype typically occurs at relatively low elevations with limited precipitation.

Dwarf Sagebrush Steppe

Dwarf sagebrush steppe communities occur on a variety of shallow-soil habitats and typically constitute one of the major matrix vegetation community subtypes throughout eastern Oregon and southern Idaho. Dwarf or low sagebrush species, including low sagebrush (*Artemisia arbuscula*) and close relatives, typically occur on mountain ridges, flanks, and broad terraces. Soils are characteristically very stony and derived from volcanic parent material. The herbaceous component found in this subtype normally includes various species of bunchgrasses and can be dominated by low-statured or mat-forming forbs.

Shrubland – Other

This shrub community occurs throughout the B2H Project area and includes shrub communities undergoing invasion from non-native shrub species like Scotch broom (*Cytisus scoparius*)or shrub communities recovering from fire disturbance. The composition of post-fire successional shrub communities depends on several factors: existing state prior to disturbance, time elapsed since disturbance, and various abiotic conditions, including rainfall, post-fire management, and fire severity and return interval (Miller et al. 2013). The typical successional pattern shows an initial dominance by grass and forb species followed by a resurgence of resprouting shrub species like Douglas rabbitbrush and horsebrush (*Tetradymia* spp.) (Miller et al. 2013). Non-sprouting shrub species like big sagebrush or bitterbrush re-establish via seed and may take decades to fully mature (Miller et al. 2013). Recently burned Shrublands have a strong possibility of conversion to Non-native Grasslands dominated by cheatgrass, especially if pre-existing condition at the site was poor.

Shrubland-Other is a very minor subtype in the B2H Project area, occurring as small, discontiguous patches generally less than one acre in extent. Although the Shrubland community subtype does occur in the 1-mile study corridor for vegetation resources, no alternative routes considered for the B2H Project cross this subtype. As such, impacts on this vegetation community are not expected and the Shrubland-other vegetation community is not discussed further in Sections 3.2.3.4 and 3.2.3.6.

Tall Sagebrush Steppe

Tall sagebrush steppe communities are widespread and dominant in eastern Oregon and southwestern Idaho, with the dominant shrub species comprising various subspecies of big sagebrush. This Shrubland community subtype is codominated by bunchgrasses, such as bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass, as well as other primary shrub species (Franklin and Dyrness 1988). While the commonly occurring Intermountain Basins Semi-Desert Shrub-Steppe ecological system also is included here, Wyoming big sagebrush (*A. tridentata* ssp. *wyomingensis*) is characteristically replaced in this ecological system by Greene's rabbitbrush (*Chrysothamnus greenei*), Douglas rabbitbrush (*C. viscidiflorus*), ephedra (*Ephedra viridis*), rubber rabbitbrush (*Ericameria nauseosa*), broom snakeweed (*Gutierrezia sarothrae*), and winterfat.

Mountain Shrub

This shrub community subtype occurs at higher elevations and differs from other Sagebrush Steppe subtypes by being typically dominated by other shrub species, due primarily to elevation and precipitation, such as antelope bitterbrush, chokecherry (*Prunus* spp.), snowberry, serviceberry *(Amelanchier alnifolia*), and soapberry (*Ceanothus* spp.*)*. Due to the higher moisture availability at sites where these communities occur, the herbaceous understory is typically robust with a variety of bunchgrasses and forbs.

FEDERALLY LISTED SPECIES

The only federally listed plant species known to occur in the B2H Project area is Howell's spectacular thelypody, specifically in Segments 2 and 3 in the Baker–Powder River Valley. A detailed description of the life and regulatory history of this species is included in Appendix D. If over the life of the project new

species are federally listed and occur within the project area they will receive the same protections as Howell's spectacular thelypody.

SENSITIVE PLANT SPECIES

The sensitive plant species known to occur in the B2H Project area are identified in Table 3-97 along with their listing status. This list may change through the life of the project. New species added to the agency lists would receive the same protections as the species currently on the list. Species accounts, including habitat requirements, known distribution, and recent and historical observations are presented in Appendix D.

Table 3-97. Sensitive Plant Species Occurring in the B2H Project Area

Common Name[1]	Scientific Name[1]	Agency Listing Status
Aloina Moss	*Aloina bifrons*	Oregon BLM
Bank Monkeyflower	*Mimulus clivicola*	Idaho BLM
Barren Milkvetch	*Astragalus cusickii var. sterilis*	Oregon BLM, Idaho BLM, Oregon State Threatened
Carveseed	*Glyptopleura marginata*	Idaho BLM
Columbian Carpet Moss	*Bryoerythrophyllum columbianum*	Oregon BLM
Cordilleran Sedge	*Carex cordillerana*	Oregon BLM, USFS
Cronquist's Stickseed	*Hackelia cronquistii*	Oregon BLM, Idaho BLM, Oregon State Threatened
Cusick's Pincushion	*Chaenactis cusickii*	Idaho BLM
Doublet	*Dimeresia howellii*	Idaho BLM
Douglas' Clover	*Trifolium douglasii*	Oregon BLM, Idaho BLM, USFS
Esteve's Pincushion	*Chaenactis stevioides*	Idaho BLM
False Naked Buckwheat	*Eriogonum novonudum*	Idaho BLM
Flowery Phlox	*Phlox multiflora*	Oregon BLM, USFS
Greeley's Springparsely	*Cymopterus acaulis var. greeleyorum*	Oregon BLM, Idaho BLM
Hairy Wild Cabbage	*Caulanthus pilosus*	Oregon BLM
Idaho Milkvetch	*Astragalus conjunctus*	Idaho BLM
Janish's Penstemon	*Penstemon janishiae*	Idaho BLM
King's Snapdragon	*Sairocarpus kingii*	Idaho BLM
Laurent's Milkvetch	*Astragalus collinus var. laurentii*	Oregon BLM, Oregon State Threatened
Malheur Cryptantha	*Cryptantha propria*	Idaho BLM
Mingan Moonwort	*Botrychium minganense*	Oregon BLM
Mountain Moonwort	*Botrychium montanum*	Oregon BLM, USFS
Mulford's Milkvetch	*Astragalus mulfordiae*	Oregon BLM, Idaho BLM, Oregon State Endangered
Oregon Princesplume	*Stanleya confertiflora*	Oregon BLM, Idaho BLM
Oregon Semaphore Grass	*Pleuropogon oregonus*	Oregon BLM, USFS, Oregon State Threatened
Owyhee Yellow Phacelia	*Phacelia lutea var. calva*	Idaho BLM
Retrorse Sedge	*Carex retrorsa*	Oregon BLM, USFS
Rigid Threadplant	*Nemacladus rigidus*	Idaho BLM
Salt Heliotrope	*Heliotropium curassavicum*	Oregon BLM, USFS
Saltwort Buckwheat	*Eriogonum salicornioides*	Oregon BLM

Table 3-97. Sensitive Plant Species Occurring in the B2H Project Area		
Common Name[1]	**Scientific Name[1]**	**Agency Listing Status**
Scabland Penstemon	*Penstemon deustus var. variabilis*	Oregon BLM, USFS
Seaside Heliotrope	*Heliotropium curassavicum var. obovatum*	Oregon BLM, USFS
Shining Flatsedge	*Cyperus bipartitus*	Idaho BLM
Simpson Hedgehog Cactus	*Pediocactus simpsonii*	Idaho BLM
Small Phacelia	*Phacelia minutissima*	Oregon BLM, Idaho BLM, USFS
Smooth Stickleaf	*Mentzelia mollis*	Oregon BLM, Idaho BLM, Oregon State Endangered
Snake River Goldenweed	*Pyrrocoma radiata*	Oregon BLM, Idaho BLM, Oregon State Endangered
Tolmie's Onion	*Allium tolmiei var. persimile*	Idaho BLM
Water-Thread Pondweed	*Potamogeton diversifolius*	Oregon BLM, Idaho BLM, USFS
White Wooly Buckwheat	*Eriogonum ochrocephalum var. calcareum*	Idaho BLM
Wishbone Bush	*Mirabilis laevis var. retrorsa*	None
Woolyfruit Sedge	*Carex lasiocarpa var. americana*	Oregon BLM, USFS
Table Note: [1]Nomenclature follows Integrated Taxonomic Information Systems		

Sensitive plant species presence, the number of known occurrences in the 10-mile-wide special status plant species analysis corridor and the 1-mile-wide vegetation resources analysis corridor, and the number of known occurrences on federal or state and private lands are discussed by segment.

NOXIOUS WEEDS

Noxious weeds include all species listed on state and county noxious weed lists. Table D-1 in Appendix D identifies the noxious weeds potentially occurring in the vegetation resources analysis corridor.

Some noxious weed species have significant factors that affect their spread and control throughout the B2H Project area. Factors that affect the ability of some noxious weed species to spread or be controlled in the B2H Project area include local density or abundance, statutes dictating mandatory controls, or limits on methods of control (especially herbicides). Other factors, including toxicity to livestock, detrimental effects on the biodiversity of natural communities, or increased production of fuel loads for wildfires, may influence public will to prevent or reduce infestations. Management techniques for noxious weeds are described in the Noxious Weed Management Plan, and Reclamation, Revegetation, and Monitoring Plan Framework (Appendix B and Appendix C of the POD).

TRADITIONAL FOODS AND ETHNOBOTANICAL RESOURCES

Traditional foods and ethnobotanical resources include plants important to tribal groups for subsistence and economic, medical, and ceremonial purposes. Ethnohabitats are microhabitats defined by tribal members as having particular importance. A sample of plant species that may have cultural value to tribes and the species' associated primary vegetation community and sites in which they commonly occur is presented in Table 3-98.

Table 3-98. Potential Ethnobotanical Resources		
Primary Vegetation Community	**Specific Habitat/Feature**	**Associated Plants of Cultural Value**
Shrublands	Lithic soils	Sagebrush; roots, including biscuit root (*Lomatium* spp.), bitterroot (*Lewisia* spp.), yampa (*Perieridia* spp.)
Riparian Conservation Areas	Wet/moist meadow	Camas (*Camassia* spp.); bistort (*Polygonum* spp.); sedge; tobacco root (*Valeriana* spp.); cow parsnip (*Heraculum* spp.)
Riparian Conservation Areas	Riparian areas	Chokecherry; currant (*Ribes* spp.); serviceberry; willow; red-osier dogwood (*Cornus sercia*); elderberry (*Sambucus*); hawthorn (*Cretaegus* spp.); rose (*Rosa*); Indian hemp (*Apocynum* spp.)
Riparian Conservation Areas	Wet woodland	Western spring beauty (*Claytonia* spp.); yellow bell (*Fritillaria* spp.)
Grasslands	Dry slope and grassland	Wild onion (*Allium* spp.); sego or mariposa lily (*Calochortus* spp.); balsamroot (*Balsamorhiza* spp.); Hyacinth (*Camassia* spp.)
Forests/Woodlands	Forest	Huckleberry (*Vaccinium* spp.); black tree lichen; mushroom varieties; pine species
Table Source: Baker Resource Management Plan (BLM 1989)		

The BLM has commissioned ethnographic studies among the Shoshone Paiute Tribes of the Duck Valley Indian Reservation, the Burns Paiute Tribe, and the CTUIR to identify botanical resources that may possess important spiritual, cultural, and/or economic values. In 2013, the CTUIR conducted an ethnobotanical survey of the NWSTF Boardman which identified areas of traditional foods and traditional foods less common elsewhere in the region.

The vegetation communities identified in the vegetation resources analysis corridor provide habitat for vegetation that is culturally significant to tribes. Ethnographic studies may reveal more precise information on location, distribution, and condition of plant communities. Exercise of treaty rights could include collection of plants for economic, religious, and cultural use. Treaty rights, and potential impacts on the exercise of treaty rights are discussed in greater detail in the Section 3.2.13. Various historical factors arising from European contact and development within the vegetation resources study corridor have adversely affected the availability of these plants for tribal use. The invasion of invasive plants, road building, fire, and agricultural developments are among the sources of disruption. The affected environment of traditional foods and ethnobotanical resources is discussed in the context of their source vegetation communities, and specific locations of particular ethnobotanical resources will not be evaluated in the segment analyses.

SEGMENT 1—MORROW-UMATILLA

Vegetation Communities

Table 3-99 presents the resource inventory for all alternative routes and route variations in Segment 1. The distribution of these vegetation communities in Segment 1 is displayed on MV-7.

Applicant's Proposed Action Alternative

Vegetation communities crossed by the Applicant's Proposed Action Alternative are summarized in Table 3-99. In the western portion of Segment 1 from the Boardman substation to Pilot Rock, the Applicant's Proposed Action Alternative predominantly crosses Agriculture and Tall Sagebrush Steppe vegetation communities. Where the Applicant's Proposed Action Alternative travels east of Pilot Rock into the foothills of the Blue Mountains (Links 1-63, 1-65, 1-71, 1-77), it crosses Mixed Conifer Forest and Aspen vegetation communities. The Applicant's Proposed Action Alternative crosses both Native and Non-native Grasslands and RCAs across the entire alternative route.

The Applicant's Proposed Action Alternative crosses areas burned during the 2015 Boardman fire (Link 1-27). The vegetation communities affected by this wildfire may no longer reflect the vegetation community description identified from the NWGAP dataset, particularly areas of Tall Sagebrush Steppe. Tall Sagebrush Steppe vegetation communities can take decades to recover from fire disturbance and may be in an early seral stage dominated by perennial bunchgrasses or shrubs other than big sagebrush, or have transitioned into a community more typical of a Non-native Grassland if invasion by annual grasses and long-term alterations to the fire regime occur (Miller et al. 2013). In the western portion of Segment 1 (Link 1-27), the Applicant's Proposed Action Alternative crosses a Research Natural Area (RNA; RNA-B) along the eastern boundary of NWSTF Boardman established to preserve remnant high-quality sagebrush vegetation communities in a region largely disturbed by agriculture and historic grazing.

Variation S1-B1

Variation S1-B1 follows the same alignment as the Applicant's Proposed Action Alternative at the eastern end of the segment and predominantly crosses Mixed Conifer Forest and RCA vegetation communities.

Variation S1-B2

Variation S1-B2 follows a more northerly alignment than the Variation S1-B1 but crosses similar types of vegetation communities and similar extents (Table 3-99).

Additional Action – 69-Kilovolt Line Replacement

As part of the Applicant's Proposed Action Alternative, an existing 69-kV transmission line on the NWSTF Boardman would be decommissioned and rebuilt east of the Bombing Range Road with an existing 115-kV transmission line as a 230-kV transmission line. The decommissioning and replacement of the 69-kV transmission line would follow one of three design options. Under any of the design options considered, the rebuilt 230-kV transmission line would not be located on the NWSTF Boardman and would not cross any RNAs on the NWSTF Boardman.

Table 3-99. Vegetation Resources Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)																
Alternative Route	**Total Length (miles)**	**Agriculture**	**Aspen**	**Bare Ground, Cliffs, Talus**	**Desert Shrub**	**Developed/Disturbed**	**Dwarf Sagebrush Steppe**	**Forest- Other**	**Juniper and Mahogany Woodland**	**Mixed Conifer Forest**	**Mountain Shrub**	**Native Grasslands**	**Non-Native Grasslands**	**Open Water**	**Riparian Conservation Area**	**Tall Sagebrush Steppe**
Applicant's Proposed Action	91.9	31.5	0.3	0.0	0.4	1.9	0.1	0.1	0.0	13.6	0.2	7.5	4.4	0.0	5.3	26.6
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.7*	*0.0*	*0.1*	*0.0*	*0.0*	*0.5*	*0.1*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*5.1*	*0.0*	*0.0*	*0.0*	*0.0*	*1.0*	*0.2*
East of Bombing Range Road	92.3	37.7	0.3	0.0	0.6	0.5	0.1	0.1	0.0	13.6	0.2	7.4	4.7	0.1	5.3	21.7
Applicant's Proposed Action – Southern Route	99.1	27.6	0.3	0.0	0.4	1.9	0.4	0.1	0.2	14.7	0.3	11.1	4.9	0.0	6.8	30.4
West of Bombing Range Road – Southern Route	95.6	18.9	0.3	0.0	0.3	1.8	0.5	0.1	0.2	14.7	0.3	14.2	5.8	0.0	7.4	31.1
Longhorn	88.2	33.4	0.3	0.0	0.2	0.9	0.1	0.1	0.0	13.6	0.2	7.6	5.4	0.2	5.4	20.8
Interstate 84	84.7	22.0	0.3	0.0	0.0	12.4	0.1	0.1	0.0	13.6	0.2	6.8	3.9	1.8	10.0	13.5
Variation S1-A1	*18.5*	*5.2*	*0.0*	*0.0*	*0.0*	*8.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*1.7*	*0.0*	*1.1*	*1.9*
Variation S1-A2	*18.5*	*5.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.8*	*0.0*	*0.9*	*10.3*
Interstate 84 – Southern Route	93.4	19.5	0.3	0.0	0.0	12.4	0.4	0.1	0.2	14.7	0.3	10.5	4.5	1.8	11.5	17.2

Design Option 1

The first design option requires decommissioning approximately 12 miles of the existing 69-kV transmission line on the NWSTF Boardman, which would be rebuilt east of Bombing Range Road with the existing 115-kV transmission line for approximately 3.5 miles north of Homestead Lane and as a new double circuit 230-kV transmission line for approximately 8.5 miles south of Homestead Lane. The new 230-kV transmission line would rejoin the existing 69-kV transmission line just south of where the proposed B2H 500-kV transmission line turns east off the NWSTF Boardman (Links 1-33 and 1-35). The portion of the existing 69-kV transmission line to be decommissioned crosses Tall Sagebrush Steppe, while the new 230-kV transmission line would primarily cross Agriculture vegetation communities.

Design Option 2

The second design option requires decommissioning approximately 15.6 miles of the existing 69-kV transmission line on the NWSTF Boardman, which would be rebuilt east of Bombing Range Road with an existing 115-kV transmission line as a double circuit 230-kV transmission line for approximately 17.7 miles traveling south of the NWSTF Boardman before rejoining the existing 69-kV transmission line. The portion of the new 230-kV transmission line south of Homestead Lane would initially be energized at 69-kV and would not require the construction of a step-down station where it rejoins the existing 69-kV transmission line south of the NWSTF Boardman. The portion of the existing 69-kV transmission line to be decommissioned crosses Tall Sagebrush Steppe, while the new 230-kV transmission line would primarily cross Agriculture vegetation communities east of Bombing Range Road and Tall Sagebrush Steppe vegetation communities south of the NWSTF Boardman.

Design Option 3

The third design option requires decommissioning approximately 15.6 miles of the existing 69-kV transmission line on the NWSTF Boardman and assumes a new 230-kV transmission line has been built east of Bombing Range Road to support wind energy development in the region. South of the NWSTF Boardman, the existing 69-kV transmission line would connect to the built 230-kV transmission line and would require the construction of a new step-down station at this location. The portion of the existing 69-kV transmission line to be decommissioned crosses Tall Sagebrush Steppe, while the new 230-kV transmission line would primarily cross Agriculture vegetation communities east of Bombing Range Road and Tall Sagebrush Steppe vegetation communities south of the NWSTF Boardman. The new step-down station would be built in Tall Sagebrush Steppe vegetation communities.

East of Bombing Range Road Alternative

Vegetation communities crossed by the East of Bombing Range Road Alternative are summarized in Table 3-99. The types and extents of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative, but the East of Bombing Range Road Alternative crosses greater amounts of Agriculture vegetation communities where the alternative route would be sited east of Bombing Range Road (Links 1-25 and 1-33). The East of Bombing Range Road Alternative does not cross any areas burned by wildfires in the 2015 fire season, or the NWSTF Boardman.

Applicant's Proposed Action – Southern Route Alternative

Vegetation communities crossed by the Applicant's Proposed Action-Southern Route Alternative are summarized in Table 3-99. The types and extents of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative, although the Applicant's Proposed Action-Southern Route Alternative crosses greater amounts of Mixed Conifer Forest, Native Grasslands, RCAs, and Tall Sagebrush Steppe than the Applicant's Proposed Action Alternative where the Applicant's Proposed Action – Southern Route Alternative diverges south across Butter Creek into the less developed landscape south of Pilot Rock (Links 1-36, 1-38, 1-62, 1-64, and 1-66). The Applicant's Proposed Action-Southern Route Alternative also crosses Juniper and Mahogany vegetation communities.

The Applicant's Proposed Action-Southern Route Alternative does cross areas burned in the 2015 Boardman fire. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Applicant's Proposed Action – Southern Route Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset. In the northern portion of Segment 1 (Link 1-27), the Applicant's Proposed Action-Southern Route Alternative crosses the NWSTF Boardman and an RNA (RNA-B) established to preserve remnant high-quality sagebrush vegetation communities in a region largely disturbed by agriculture and historic grazing.

Additional Action – 69-Kilovolt Line Replacement

The Applicant's Proposed Action – Southern Route Alternative also would require the additional action of decommissioning and replacing the existing 69-kV transmission on the NWSTF Boardman. The types of vegetation communities crossed, as well as the design options of the additional action, would be the same as the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

Vegetation communities crossed by the West of Bombing Range Road-Southern Route Alternative are summarized in Table 3-99. The types of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative, although the West of Bombing Range Road-Southern Alternative also crosses Juniper and Mahogany vegetation communities. The West of Bombing Range Road-Southern Route crosses less Agriculture vegetation communities than the Applicant's Proposed Action Alternative, but does cross greater amounts of Mixed Conifer Forest, Native Grasslands, RCAs, and Tall Sagebrush Steppe vegetation communities where the alternative route diverges south across Butter Creek into the less developed landscape south of Pilot Rock (Links 1-36, 1-38, 1-62, 1-64, and 1-66). The West of Bombing Range Road-Southern Route Alternative does cross areas burned by the 2015 Boardman fire (Link 1-27). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the West of Bombing Range Road – Southern Route Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset. In the northern portion of Segment 1 (Link 1-27), the West of Bombing Range Road-Southern Route Alternative crosses the NWSTF Boardman and a RNA (RNA-B) established to preserve remnant high-quality sagebrush vegetation communities in a region largely disturbed by agriculture and historic grazing.

Additional Action – 69-Kilovolt Line Replacement

The West of Bombing Range Road – Southern Route Alternative also would require the additional action of decommissioning and replacing the existing 69-kV transmission on the NWSTF Boardman. The types of vegetation communities crossed, as well as the design options of the additional action, would be the same as the Applicant's Proposed Action Alternative.

Longhorn Alternative

Vegetation communities crossed by the Longhorn Alternative are summarized in Table 3-99. The types and extents of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative. The Longhorn Alternative does not cross any areas burned by wildfires during the 2015 fire season, or the NWSTF Boardman.

Interstate 84 Alternative

Vegetation communities crossed by the Interstate 84 Alternative are summarized in Table 3-99. West of Pendleton, the Interstate 84 Alternative predominantly crosses Agriculture, Developed/Disturbed, and Tall Sagebrush Steppe vegetation communities. In the eastern portion of Segment 1 where the alternative route crosses the Blue Mountain foothills, the Interstate 84 Alternative also crosses Mixed Conifer Forests and Aspen vegetation communities. The Interstate 84 Alternative crosses the greatest amount of Developed/Disturbed vegetation communities. The Interstate 84 Alternative does not cross any areas burned by wildfires during the 2015 fire season, or the NWSTF Boardman.

Variation S1-A1

Variation S1-A1 follows the same alignment as the Interstate 84 Alternative in the area where the alternative route crosses the Umatilla River and crosses the same vegetation communities.

Variation S1-A2

Variation S1-A2 follows a more southerly alignment than Variation S1-A1 to allow colocation with an existing transmission line and crosses predominantly Tall Sagebrush Steppe where Variation S1-A1 crosses Developed/Disturbed vegetation communities.

Interstate 84 – Southern Route Alternative

Vegetation communities crossed by the Interstate 84 – Southern Route Alternative are summarized in Table 3-99. Vegetation communities crossed by the alternative route are similar to the Interstate 84 Alternative. The Interstate 84 – Southern Route Alternative does not cross any areas burned by wildfires during the 2015 fire season, or the NWSTF Boardman.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Other Alternatives

Federally listed and candidate plant species are not known to occur in the special status plant species study corridor of any alternative route in Segment 1.

Other Sensitive Plant Species

Tables 3-100 and 3-101 summarize the extent and distribution of sensitive plant species occurrences in the 1-mile and 10-mile analysis corridors.

Table 3-100. Number of Sensitive Plant Species Occurrences in the 1-mile Corridor for Segment 1—Morrow-Umatilla

Alternative Route	Laurent's Milkvetch	Retrorse Sedge
Applicant's Proposed Action	10	0
Variation S1-B1	*0*	*0*
Variation S1-B2	*0*	*0*
East of Bombing Range Road	10	0
Applicant's Proposed Action – Southern Route	10	0
West of Bombing Range Road – Southern Route	1	0
Longhorn	9	0
Interstate 84	2	0
Variation S1-A1	*2*	*0*
Variation S1-A2	*1*	*1*
Interstate 84 – Southern Route	2	0

Table 3-101. Number of Sensitive Plant Species Occurrences in the 10-mile Analysis Corridor for Segment 1—Morrow-Umatilla

Alternative Route	Aloina Moss	Laurent's Milkvetch	Mingan Moonwort	Columbian Carpet Moss	Retrorse Sedge	Shining Flatsedge	Salt Heliotrope	Scabland Penstemon	Flowery Phlox
Applicant's Proposed Action	1	16	2	1	0	0	0	1	1
Variation S1-B1	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*1*	*1*
Variation S1-B2	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*1*	*1*
East of Bombing Range Road	1	16	2	1	0	0	0	1	1
Applicant's Proposed Action – Southern Route	1	16	2	1	0	0	0	1	1
West of Bombing Range Road – Southern Route	1	9	2	1	0	0	0	1	1
Longhorn	0	16	2	0	0	0	0	1	1
Interstate 84	4	6	2	1	1	1	2	1	1
Variation S1-A1	*0*	*2*	*0*	*0*	*1*	*0*	*1*	*0*	*0*
Variation S1-A2	*0*	*3*	*0*	*0*	*1*	*0*	*1*	*0*	*0*
Interstate 84 – Southern Route	4	6	2	1	1	1	2	1	1

Applicant's Proposed Action Alternative and All Other Alternatives

Several sensitive plant species are known to occur in the 1-mile and 10-mile analysis corridors of the Applicant's Proposed Action Alternative and all other alternative routes (Tables 3-100 and 3-101). The Interstate 84 Alternative and the Interstate 84 - Southern Route Alternative contain the greatest number of species in their respective 10-mile analysis corridors, with Variation S1-A2 to the Interstate 84

Alternative being the only route or variation to contain retrorse sedge in the 1-mile corridor. Only Laurent's milkvetch occurs in the 1-mile corridor for all other alternative routes, but is not known to exist in the 1-mile corridor of either variation to the Applicant's Proposed Action Alternative.

USFS Sensitive Plant Species

The Applicant's Proposed Action Alternative and all other alternative routes cross USFS-administered lands at the eastern portion of Segment 1 along the same alignment (Link 1-77). Additionally, Variation S1-B1 and Variation S1-B2 cross USFS-administered lands at the similar locations, with Variation S1-B2 following a more northerly alignment than Variation S1-B1, which follows the same alignment as the Applicant's Proposed Action and all other alternative routes. Several USFS sensitive plant species occurrences are contained in the 10-mile analysis corridor of the alternatives and variations, including salt heliotrope, scabland penstemon, retrorse sedge, and flowery phlox. However, no known occurrences of USFS sensitive plant species exist in the 1-mile analysis corridor of any alternative route or variation crossing USFS-administered land in Segment 1. Retrorse sedge is known to occur in the 1-mile analysis corridor of Variation S1-A2, but the occurrence is west of Pendleton and not located near USFS-administered land.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

Twenty species of noxious, state, or county listed weeds are known to occur in the vegetation resources analysis corridor of Segment 1. Most mapped weed occurrences are located in the Agriculture vegetation communities along Interstate 84 and near Pendleton. Tall Sagebrush Steppe and Grassland vegetation communities, both native and non-native, along the Applicant's Proposed Alternative have relatively few known mapped weed occurrences. Large infestations of both yellow star-thistle and diffuse knapweed occur along the Interstate 84 Alternative and Interstate 84 – Southern Route Alternative routes. Both species are aggressive invaders of arid landscapes and can cause significant economic impacts on range and agricultural lands as well as displace native vegetation (ODA 2015). Other common noxious weeds, rush skeleton weed (*Chondrilla juncea*), St. John's wort (*Hypericum perforatum*), and whitetop (*Cardaria draba*) also are present in the vegetation resources study corridor in Segment 1.

The identified weeds with mapped occurrences include those listed on state and country noxious weed lists. They do not represent a comprehensive list of all invasive plant species or noxious weeds that could potentially occur in Segment 1. A list compiled from state and county noxious weed lists of weeds potentially occurring in the B2H Project area is available in Table D-1 in Appendix D.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

Traditional foods and ethnobotanical resources have the potential to occur along all alternative routes and variations where appropriate vegetation communities exist. Ethnobotanical surveys conducted by the CTUIR in 2013 on the NWSTF Boardman identified areas of abundant traditional foods and other ethnobotanical resources, as well as remnant populations of ethnobotanical resources, which have

become less common in the region as a result of ongoing agricultural and urban development. Much of the vegetation in Segment 1, especially the portion west of Pendleton, is dominated by Agriculture and Developed/Disturbed vegetation communities which are unlikely to support these resources. However, all alternative routes and variations do cross several native vegetation communities in the Pilot Rock region and east. These vegetation communities are predominantly Tall Sagebrush Steppe, Native Grasslands, or Mixed Conifer Forest vegetation communities likely to support various traditional foods like cous, berries, and various mosses and fungi. In addition, RCA vegetation communities crossed by the B2H Project also are likely to provide several traditional foods and ethnobotanical resources.

SEGMENT 2—BLUE MOUNTAINS

Vegetation Communities

Table 3-102 presents the resource inventory for all alternative routes and route variations in Segment 2. The distribution of these vegetation communities in Segment 2 is displayed on MV-7.

Applicant's Proposed Action Alternative

Vegetation communities crossed by the Applicant's Proposed Action Alternative are summarized in Table 3-102. In the northern portion of Segment 2 from Hilgard to south of Ladd Marsh (Links 2-1, 2-5, 2-30, 2-35, 2-45, and 2-47), the Applicant's Proposed Action Alternative predominantly crosses Mixed Conifer Forest and Mountain Shrub vegetation communities. Where the Applicant's Proposed Action Alternative travels north of Clover Creek Valley in Segment 2 (Links 2-75, 2-85, and 2-95), it predominantly crosses Tall Sagebrush Steppe vegetation communities. The Applicant's Proposed Action Alternative also crosses Native Grassland and RCA vegetation communities throughout the alternative route. The Applicant's Proposed Action Alternative does not cross any areas burned by wildfires in the 2015 fire season.

Variation S2-A1

Variation S2-A1 follows the same alignment as the Applicant's Proposed Action Alternative at the northern end of Segment 2 and predominantly crosses Mixed Conifer Forest and Native Grassland vegetation communities.

Variation S2-A2

Variation S2-A2 follows a more southerly alignment than Variation S2-A1 and predominantly crosses Mixed Conifer Forest and RCA vegetation communities.

Variation S2-B1

Variation S2-B1 follows the same alignment as the Applicant's Proposed Action Alternative at the northern end of Segment 2 and predominantly crosses Mixed Conifer Forest, Mountain Shrub and RCA vegetation communities.

Table 3-102. Vegetation Resources Inventory Data for Segment 2—Blue Mountains (miles crossed)																
Alternative Route	**Total Length (miles)**	**Agriculture**	**Aspen**	**Bare Ground, Cliffs, Talus**	**Desert Shrub**	**Developed/Disturbed**	**Dwarf Sagebrush Steppe**	**Forest- Other**	**Juniper and Mahogany Woodland**	**Mixed Conifer Forest**	**Mountain Shrub**	**Native Grasslands**	**Non-Native Grasslands**	**Open Water**	**Riparian Conservation Area**	**Tall Sagebrush Steppe**
Applicant's Proposed Action	33.8	0.3	0.2	0.0	0.0	0.0	0.1	0.0	1.1	10.1	7.1	1.7	0.1	0.0	5.0	8.1
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.4*	*0.2*	*0.9*	*0.0*	*0.0*	*0.1*	*0.2*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.5*	*0.2*	*0.6*	*0.0*	*0.0*	*0.6*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*1.2*	*1.4*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.4*	*0.7*	*0.0*	*0.0*	*0.0*	*1.0*	*0.7*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*5.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.5*	*2.8*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.7*	*4.7*	*0.1*	*0.0*	*0.0*	*0.0*	*0.8*	*2.4*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.2*	*0.5*	*0.0*	*0.0*	*0.0*	*0.3*	*0.3*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.8*	*0.3*	*0.0*	*0.0*	*0.0*	*0.2*	*0.9*
Variation S2-F1	*12.1*	*0.3*	*0.2*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.1*	*3.8*	*0.8*	*0.1*	*0.0*	*2.3*	*4.4*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.2*	*0.0*	*0.2*	*0.0*	*2.7*	*0.6*	*0.1*	*0.0*	*1.6*	*6.7*
Glass Hill	33.7	0.3	0.2	0.2	0.0	0.0	0.1	0.0	1.3	8.9	7.9	1.7	0.1	0.0	5.4	7.6
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.0*	*2.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.4*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.4*	*0.0*	*0.6*	*0.1*	*0.0*	*0.8*	*0.2*
Mill Creek	34.0	0.2	0.0	0.0	0.0	0.1	0.2	0.0	1.3	7.3	6.9	1.8	0.3	0.0	4.6	11.3

Variation S2-B2

Variation S2-B2 follows a more northerly alignment than Variation S2-B1 and crosses Tall Sagebrush Steppe vegetation communities in addition to those crossed by Variation S1-B1. Variation S2-B2 crosses similar extents of Mixed Conifer Forest and RCA vegetation communities but lesser amounts of Mountain Shrub.

Variation S2-C1

Variation S2-C1 follows the same alignment as the Applicant's Proposed Action Alternative in the central portion of Segment 2 near Morgan Lake (Links 2-45, 2-47 and 2-50) and predominantly crosses Mixed Conifer Forest and Tall Sagebrush Steppe vegetation communities.

Variation S2-C2

Variation S2-C2 follows a more easterly alignment than Variation S2-C1 to pass closer to Morgan Lake (Link 2-48), and crosses the Dwarf Sagebrush Steppe in addition to the vegetation communities crossed by Variation S2-C1. The extent of vegetation communities crossed by Variation S2-C2 is similar to Variation S2-C1.

Variation S2-E1

Variation S2-E1 follows the same alignment as the Applicant's Proposed Action Alternative and predominantly crosses Mixed Conifer Forest as well as Mountain Shrub, RCA, and Tall Sagebrush Steppe vegetation communities.

Variation S2-E2

Variation S2-E2 follows a more northeasterly alignment than Variation S2-E2 and crosses Juniper and Mahogany Woodlands in addition to the vegetation communities crossed by Variation S2-E1. Variation S2-E2 crosses greater amounts of Tall Sagebrush Steppe but lesser amounts of Mixed Conifer Forest than Variation S2-E1.

Variation S2-F1

Variation S2-F1 follows the same alignment as the Applicant's Proposed Action Alternative at the southern end of Segment 2 and predominantly crosses Mountain Shrub, RCA, and Tall Sagebrush Steppe vegetation communities. Variation S2-F1 also crosses Agriculture, Aspen, Dwarf Sagebrush Steppe, Mixed Conifer Forest, and Non-native Grassland vegetation communities.

Variation S2-F2

Variation S2-F2 follows a more northerly alignment than Variation S2-F1 to allow colocation with existing transmission lines and predominantly crosses Mountain Shrub, RCA, and Tall Sagebrush Steppe vegetation communities. It also crosses Tall Sagebrush Steppe to a lesser extent than Variation S2-F1. Variation S2-F2 also crosses Developed/Disturbed and Juniper and Mahogany Woodlands.

Glass Hill Alternative

Vegetation communities crossed by the Glass Hill Alternative are summarized in Table 3-102. The types of vegetation communities crossed by the Glass Hill Alternative are similar to those crossed by

the Applicant's Proposed Action Alternative in Segment 2, although the Glass Hill Alternative also crosses minimal amounts of Bare Ground, Cliffs, and Talus vegetation communities. The Glass Hill Alternative crosses lesser amounts of Mixed Conifer Forest and Tall Sagebrush Steppe but greater amounts of Mountain Shrub and RCA vegetation communities. The Glass Hill Alternative does not cross any areas burned by wildfires in the 2015 fire season.

Variation S2-D1

Variation S2-D1 follows the same alignment as the Glass Hill Alternative in the central portion of Segment 2 and predominantly crosses Mixed Conifer Forest vegetation communities, but also cross Juniper and Mahogany Woodland, RCA, and Tall Sagebrush Steppe vegetation communities.

Variation S2-D2

Variation S2-D2 follows a more southerly alignment and predominantly crosses Mixed Conifer Forest vegetation communities. Variation S2-D2 does not cross Juniper and Mahogany Woodland but crosses both Native and Non-native Grassland vegetation communities.

Mill Creek Alternative

Vegetation communities crossed by the Mill Creek Alternative are summarized in Table 3-102. The types of vegetation communities crossed by the Mill Creek Alternative are similar the Applicant's Proposed Action Alternative, although the Mill Creek Alternative crosses minimal amounts of Developed/Disturbed and does not cross Aspen vegetation communities. The Mill Creek Alternative crosses lesser amounts of Mixed Conifer Forest, but greater amounts of Tall Sagebrush Steppe than the Applicant's Proposed Action Alternative. The Mill Creek Alternative does not cross any areas burned by wildfires in the 2015 fire season.

Federally Listed and Candidate Plant Species

Table 3-103 summarizes the extent and distribution of known Howell's spectacular thelypody occurrences in the 10-mile analysis corridor. Howell's spectacular thelypody is not known to occur in the 1-mile analysis corridor for the Applicant's Proposed Action Alternative or any alternative route considered in Segment 2.

Table 3-103. Howell's Spectacular Thelypody Occurrences in the 10-mile Analysis Corridor for Segment 2—Blue Mountains

Alternative Route	Number of Occurrences
Applicant's Proposed Action	9
Variation S2-A1	*0*
Variation S2-A2	*0*
Variation S2-B1	*0*
Variation S2-B2	*0*
Variation S2-C1	*0*
Variation S2-C2	*0*
Variation S2-E1	*0*
Variation S2-E2	*0*

Table 3-103. Howell's Spectacular Thelypody Occurrences in the 10-mile Analysis Corridor for Segment 2—Blue Mountains	
Alternative Route	**Number of Occurrences**
Variation S2-F1	*9*
Variation S2-F2	*9*
Glass Hill	9
Variation S2-D1	*0*
Variation S2-D2	*0*
Mill Creek	9

Applicant's Proposed Action Alternative and All Other Alternatives

Howell's spectacular thelypody is known to occur in the 10-mile analysis corridor for the Applicant's Proposed Action Alternative and all other alternative routes, as well as Variation S2-F1 and Variation S2-F2. All alternative routes, as well as Variation S2-F1 and Variation S2-F2, contain the same nine mapped Howell's spectacular thelypody occurrences located just south of Clover Creek and near North Powder, Oregon. These nine occurrences comprise the entirety of two larger populations, the Clover Creek Valley and North Powder populations (USFWS 2010). The mapped occurrence just south of Clover Creek is the closest to the Applicant's Proposed Action Alternative and all other alternative routes, being approximately 1.4 miles from the Applicant's Proposed Action Alternative, the Glass Hill Alternative, and Variation S2-F1 (Link 2-75) and approximately 1.5 miles from the Mill Creek Alternative and Variation S2-F2 (Link 2-70).

Other Sensitive Plant Species

Tables 3-104 and 3-105 summarize the extent and distribution of sensitive plant species occurrences in the 1-mile and 10-mile analysis corridors.

Table 3-104. Number of Sensitive Plant Species Occurrences in the 1-mile Analysis Corridor for Segment 2—Blue Mountains			
Alternative Route	**Salt Heliotrope**	**Douglas' Clover**	**Oregon Semaphore Grass**
Applicant's Proposed Action	0	2	0
Variation S2-A1	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*
Variation S2-B2	*0*	*0*	*0*
Variation S2-C1	*0*	*0*	*0*
Variation S2-C2	*0*	*1*	*0*
Variation S2-E1	*0*	*0*	*0*
Variation S2-E2	*0*	*0*	*1*
Variation S2-F1	*0*	*2*	*0*
Variation S2-F2	*0*	*0*	*0*

Table 3-104. Number of Sensitive Plant Species Occurrences in the 1-mile Analysis Corridor for Segment 2—Blue Mountains

Alternative Route	Salt Heliotrope	Douglas' Clover	Oregon Semaphore Grass
Glass Hill	0	2	0
Variation S2-D1	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*
Mill Creek	1	1	1

Table 3-105. Number of Sensitive Plant Species Occurrences in the 10-mile Analysis Corridor for Segment 2—Blue Mountains

Alternative Route	Mingan Moonwort	Woolyfruit Sedge	Salt Heliotrope	Scabland Penstemon	Flowery Phlox	Oregon Semaphore Grass	Douglas' Clover
Applicant's Proposed Action	3	1	1	1	2	4	4
Variation S2-A1	*2*	*1*	*0*	*1*	*2*	*0*	*0*
Variation S2-A2	*2*	*1*	*0*	*1*	*2*	*0*	*0*
Variation S2-B1	*0*	*1*	*1*	*1*	*2*	*0*	*0*
Variation S2-B2	*0*	*1*	*1*	*1*	*2*	*0*	*0*
Variation S2-C1	*1*	*1*	*1*	*1*	*0*	*2*	*2*
Variation S2-C2	*0*	*1*	*1*	*1*	*0*	*2*	*2*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*4*	*4*
Variation S2-E2	*0*	*0*	*0*	*0*	*0*	*4*	*4*
Variation S2-F1	*0*	*0*	*0*	*0*	*0*	*4*	*2*
Variation S2-F2	*0*	*0*	*0*	*0*	*0*	*4*	*2*
Glass Hill	3	1	1	1	2	4	4
Variation S2-D1	*0*	*0*	*1*	*0*	*0*	*0*	*2*
Variation S2-D2	*0*	*0*	*1*	*0*	*0*	*0*	*2*
Mill Creek	2	1	1	1	2	4	4

Applicant's Proposed Action Alternative and All Other Alternatives

Several sensitive plant species are known to occur in the 1-mile and 10-miles analysis corridors for the Applicant's Proposed Action Alternative and all other alternative routes (Tables 3-104 and 3-105). The Applicant's Proposed Action Alternative and all other alternative routes contain the same sensitive plant species and similar numbers of occurrences in their respective 10-mile analysis corridors. The 1-mile analysis corridor for the Mill Creek Alternative contains the greatest number of sensitive species and number of mapped occurrences, including salt heliotrope, Douglas' clover, and Oregon semaphore grass, while both the Applicant's Proposed Action Alternative and the Glass Hill Alternative only contain two mapped occurrences of Douglas' clover in the 1-mile analysis corridor.

USFS Sensitive Plant Species

The Applicant's Proposed Action Alternative and all other alternative routes, as well as Variation S2-A1 and Variation S2-A2, cross USFS-administered lands and contain several USFS sensitive plant species in their respective 10-mile analysis corridors, including woolyfruit sedge, salt heliotrope, scabland penstemon, flowery phlox, Oregon semaphore grass, and Douglas' clover. Of these species, only Douglas' clover is contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative and all other alternatives, while the 1-mile analysis corridor for the Mill Creek Alternative also contains salt heliotrope and Oregon semaphore grass. Variation S2-A1 and Variation S2-A2 do not contain known occurrences of USFS sensitive plant species in their 1-mile analysis corridors.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Action Alternatives

Twelve species of noxious federal, state or county listed noxious weeds are known to occur in the vegetation resources study corridor of Segment 2. Most of these mapped occurrences are located in the Mixed Conifer Forest and Mountain Shrubland along the foothills south of La Grande and the I-84 corridor. Mixed Conifer Forests, Mountain Shrub, and Tall Sagebrush Steppe community subtypes found along the Applicant's Proposed Action Alternative and the Glass Hill Alternative deeper in the Wallowa-Whitman National Forest have relatively few known mapped weed occurrences. Infestations of diffuse knapweed and Scotch thistle (*Onopordium acanthium*) occur in the foothills south of La Grande along the Mill Creek Alternative (Links 2-12 and 2-63). Both species are aggressive invaders of arid landscapes and capable of displacing native vegetation, with Scotch thistle well adapted to invade openings in Mixed Conifer Forests (ODA 2015). A large infestation of Dalmatian toadflax (*Linaria dalmatica*) occurs along I-84 in the northern portion of Segment 2 for the Applicant's Proposed Action Alternative and all other alternative routes (Links 2-5 and 2-7). Like Scotch thistle, Dalmatian toadflax commonly invades and displaces native vegetation in arid landscapes and forest openings. Other common noxious weeds, Canada thistle (*Cirsium arvense*) and spotted knapweed (*Centaurea stoebe*) also are present in the study corridor of Segment 2.

The identified weeds with mapped occurrences include those listed on federal, state, and country noxious weed lists. They do not represent a comprehensive list of every invasive plant species or noxious weed that could potentially occur in Segment 2. A list compiled from state and county noxious weed lists of weeds potentially occurring in the B2H Project area is available in Table D-1 in Appendix D.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

Traditional foods and ethnobotanical resources have the potential to occur along all alternative routes and variations where appropriate vegetation communities exist. Much of the vegetation crossed by alternative routes in Segment 2, particularly the northern and central portions in the Blue Mountains, is dominated by Mixed Conifer Forest and Mountain Shrub vegetation communities likely to support berries, mosses and fungi, and other important ethnobotanical resources. In Segment 2, all alternative

routes and variations also cross Tall Sagebrush Steppe and RCA vegetation communities likely to provide several traditional foods and ethnobotanical resources.

SEGMENT 3—BAKER VALLEY

Vegetation Communities

Table 3-106 presents the resource inventory for all alternative routes and route variations in Segment 3. The distribution of these vegetation communities in Segment 3 is displayed on MV-7.

Applicant's Proposed Action Alternative

The vegetation communities crossed by the Applicant's Proposed Action Alternative in Segment 3 are summarized in Table 3-106. Throughout Segment 3, the Applicant's Proposed Action Alternative predominantly crosses Tall Sagebrush Steppe vegetation communities, but also crosses Dwarf Sagebrush Steppe southeast of Baker City, Oregon (Link 3-28). The Applicant's Proposed Action Alternative crosses RCA vegetation communities throughout Segment 3. Several miles north of Baker City, the Applicant's Proposed Action crosses Tall Sagebrush Steppe vegetation communities near Magpie Peak (Link 3-12), which were considered for potential designation as an ACEC in the revisions to the Baker RMP due to their high-quality and species composition (BLM 2011). The Applicant's Proposed Action Alternative in Segment 3 does not cross any areas burned by wildfires in the 2015 season, but crosses a few, smaller areas southeast of Baker City that burned in the 2014 Radio Tower Fire (Link 3-28, 3-52, and 3-64) and pass approximately 1.5 miles from areas burned by the 2015 Cornet-Windy Ridge fire (Link 3-54 and 3-58). The vegetation communities affected by these wildfires may no longer reflect the vegetation community description identified from the NWGAP dataset, particularly areas of Tall Sagebrush Steppe. Tall Sagebrush Steppe vegetation communities can take decades to recover from fire disturbance and may be in an early seral stage dominated by perennial bunchgrasses or shrubs other than big sagebrush, or have transitioned into a community more typical of a Non-native Grassland if invasion by annual grasses and long-term alterations to the fire regime occur (Miller et al. 2013).

Variation S3-A1

Variation S3-A1 follows the same alignment as the Applicant's Proposed Action Alternative at the northern end of the segment and predominantly crosses Tall Sagebrush Steppe vegetation communities. Variation S3-A1 does not cross any areas burned by wildfires in the 2015 season.

Variation S3-A2

Variation S3-A2 roughly parallels the Applicant's Proposed Action Alternative following a more northeasterly alignment to better colocate with an existing transmission line. Variation S3-A2 crosses similar types of vegetation communities in similar extents, and also crosses the Tall Sagebrush Steppe vegetation communities considered for ACEC designation near Magpie Peak (Link 3-4). Variation S3-A2 does not cross any areas burned by wildfires in the 2015 season.

Table 3-106. Vegetation Resources Inventory Data for Segment 3—Baker Valley (miles crossed)																
Alternative Route	**Total Length (miles)**	**Agriculture**	**Aspen**	**Bare Ground, Cliffs, Talus**	**Desert Shrub**	**Developed/Disturbed**	**Dwarf Sagebrush Steppe**	**Forest- Other**	**Juniper and Mahogany Woodland**	**Mixed Conifer Forest**	**Mountain Shrub**	**Native Grasslands**	**Non-Native Grasslands**	**Open Water**	**Riparian Conservation Area**	**Tall Sagebrush Steppe**
Applicant's Proposed Action	55.2	0.1	0.0	0.4	0.0	0.2	2.1	0.0	0.0	0.0	0.4	2.6	0.7	0.0	6.3	42.4
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.2*	*0.3*	*0.1*	*0.0*	*1.4*	*10.3*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.2*	*0.3*	*0.0*	*0.8*	*10.8*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*1.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.0*	*0.0*	*0.8*	*10.9*
Variation S3-B2	*14.4*	*0.5*	*0.0*	*0.0*	*0.0*	*0.1*	*0.3*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.0*	*0.0*	*1.7*	*11.2*
Variation S3-B3	*14.7*	*0.5*	*0.0*	*0.0*	*0.0*	*0.1*	*0.6*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.2*	*0.0*	*1.6*	*11.1*
Variation S3-B4	*14.3*	*1.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.3*	*0.0*	*0.1*	*0.0*	*0.2*	*0.0*	*1.6*	*9.8*
Variation S3-B5	*14.0*	*1.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.1*	*0.0*	*1.8*	*9.8*
Variation S3-C1	*21.1*	*0.1*	*0.0*	*0.4*	*0.0*	*0.1*	*0.6*	*0.0*	*0.0*	*0.0*	*0.2*	*1.5*	*0.5*	*0.0*	*3.0*	*14.7*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.3*	*0.0*	*0.2*	*0.5*	*0.0*	*0.0*	*0.0*	*0.2*	*1.0*	*1.0*	*0.0*	*3.3*	*15.2*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*	*1.5*	*0.0*	*0.7*	*0.0*	*1.3*	*1.1*	*0.8*	*0.0*	*4.3*	*10.8*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.5*	*0.0*	*0.3*	*1.4*	*0.0*	*0.7*	*0.0*	*1.5*	*1.3*	*0.8*	*0.0*	*3.1*	*11.8*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.1*	*0.7*	*0.0*	*0.4*	*0.9*	*1.5*	*1.1*	*1.8*	*0.0*	*2.8*	*11.1*
Variation S3-C6	*24.7*	*0.0*	*0.5*	*0.5*	*0.0*	*0.1*	*0.4*	*0.0*	*0.9*	*1.5*	*1.4*	*1.9*	*1.0*	*0.0*	*4.7*	*11.8*
Flagstaff A	55.3	1.5	0.0	0.4	0.0	0.1	1.0	0.0	0.3	0.0	0.7	1.9	0.8	0.0	7.3	41.3
Timber Canyon	70.3	0.9	0.3	0.2	0.0	0.1	3.9	0.0	0.9	19.4	3.5	2.1	2.2	0.0	12.5	24.3
Flagstaff A – Burnt River Mountain	55.3	1.4	0.0	0.3	0.0	0.3	1.9	0.0	1.0	0.0	1.8	1.5	1.1	0.0	8.6	37.4
Flagstaff B	56.0	0.6	0.0	0.4	0.0	0.2	1.3	0.0	0.3	0.0	0.7	1.9	0.9	0.0	7.1	42.6
Flagstaff B – Burnt River West	55.7	0.5	0.0	0.6	0.0	0.2	1.3	0.0	0.7	0.9	1.9	1.4	2.4	0.0	6.3	39.5
Flagstaff B – Durkee	59.6	0.5	0.5	0.5	0.0	0.2	1.1	0.0	1.2	1.5	1.9	2.3	1.4	0.0	8.8	39.7

Table Note: Miles crossed will not equal the total length as some species are not present for the alternative route or overlap of species.

Variation S3-B1

Variation S3-B1 follows the same alignment as the Applicant's Proposed Action Alternative at the northern end of the segment and predominantly crosses Tall Sagebrush Steppe vegetation communities but also crosses Dwarf Sagebrush Steppe, Native Grassland, and RCA vegetation communities. Variation S3-B1 crosses areas burned in the Radio Tower Fire (Link 3-28), but does not cross any areas burned by wildfires during the 2015 season. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-B1 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-B2

Variation S3-B2 follows a more westerly alignment than the Applicant's Proposed Action Alternative to pass west of the NHOTIC. Similar to Variation S3-B1, Variation S3-B2 also predominantly crosses Tall Sagebrush Steppe vegetation communities but also crosses Agriculture, Juniper and Mahogany Woodland, Mountain Shrub, and RCA vegetation communities. Variation S3-B2 crosses areas burned in the Radio Tower Fire (Link 3-48), but does not cross any areas burned by wildfires during the 2015 season. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-B2 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-B3

Variation S3-B3 follows the same alignment as Variation S3-B2 until south of Baker City, Oregon, where it follows a more westerly alignment to better colocate with an existing transmission line. Variation S3-B3 crosses similar types and extents of vegetation communities as Variation S3-B2. Variation S3-B3 crosses Agriculture, Juniper and Mahogany Woodland, Mountain Shrub, RCA, and Tall Sagebrush Steppe vegetation communities to a greater extent, but does not cross Native Grasslands and crosses Dwarf Sagebrush Steppe to a lesser extent than Variation S3-B1. Variation S3-B3 crosses areas burned in the Radio Tower Fire (Link 3-48), but does not cross any areas burned by wildfires during the 2015 season. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-B3 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-B4

Variation S3-B4 roughly parallels Variation S3-B2, being aligned slightly west near Baker City, Oregon, crosses similar types and extents of vegetation communities as Variation S3-B2. Variation S3-B4 crosses Agriculture, Juniper and Mahogany Woodland, Mountain Shrub, and RCA vegetation communities to a greater extent, but does not cross Native Grasslands and crosses Dwarf Sagebrush Steppe and Tall Sagebrush Steppe to a lesser extent than Variation S3-B1. Variation S3-B4 crosses areas burned in the Radio Tower Fire (Link 3-48), but does not cross any areas burned by wildfires during the 2015 season. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-B4 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-B5

Variation S3-B5 roughly parallels Variation S3-B2, being aligned slightly west near the NHOTIC, crosses similar types and extents of vegetation communities as Variation S3-B2. Variation S3-B5 crosses Agriculture, Juniper and Mahogany Woodland, Mountain Shrub, and RCAs to a greater extent, but does not cross Native Grasslands and crosses Dwarf Sagebrush Steppe and Tall Sagebrush Steppe to a lesser extent than Variation S3-B1. Variation S3-B5 crosses areas burned in the Radio Tower Fire (Link 3-48), but does not cross any areas burned by wildfires during the 2015 season. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-B5 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-C1

Variation S3-C1 follows the same alignment of the Applicant's Proposed Action Alternative at the southern end of Segment 3, passing north of Durkee, Oregon. Variation S3-C1 predominantly crosses Tall Sagebrush Steppe, but also crosses RCA, Native Grassland, Dwarf Sagebrush Steppe, and Non-native Grassland. Variation S3-C1 does not cross any areas burned by wildfires during the 2015 season.

Variation S3-C2

Variation S3-C2 follows a more southerly alignment than Variation S3-C1, passing closer to Durkee, but rejoins the Variation S3-C1 alignment northeast of the community. Variation S3-C2 crosses similar types and mostly similar extents of vegetation communities as Variation S3-C1. However, Variation S3-C2 crosses Non-native Grassland, RCA, and Tall Sagebrush Steppe to a greater extent, but Native Grasslands to a lesser extent than Variation S3-C1. Variation S3-C2 does not cross any areas burned by wildfires during the 2015 season.

Variation S3-C3

Variation S3-C3 follows a more southerly alignment than Variation S3-C1, passing south of Durkee, but rejoins the Variation S3-C1 near Weatherby, Oregon. Variation S3-C3 crosses similar types and mostly similar extents of vegetation communities as Variation S3-C1. However, Variation S3-C3 crosses Dwarf Sagebrush Steppe, Juniper and Mahogany Woodlands, Mountain Shrub, and RCA to a greater extent, but Tall Sagebrush Steppe to a lesser extent than Variation S3-C1. Variation S3-C3 does cross areas burned by the 2015 Cornet-Windy Ridge fire west of Durkee (Link 3-64). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-C3 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-C4

Variation S3-C4 follows a similar alignment as Variation S3-C3, passing west of residences near Burnt River Canyon, Oregon, and rejoining the Variation S3-C1 near Weatherby, Oregon. Variation S3-C4 crosses similar types and mostly similar extents of vegetation communities as Variation S3-C1. However, Variation S3-C4 crosses Dwarf Sagebrush Steppe, Juniper and Mahogany Woodlands, and Mountain Shrub to a greater extent, but Tall Sagebrush Steppe to a lesser extent than Variation S3-C1.

Variation S3-C4 does cross areas burned by the Cornet-Windy Ridge fire west of Durkee (Links 3-68). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-C4 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-C5

Variation S3-C5 follows a more southerly alignment than Variation S3-C1, passing south of Durkee, Oregon to rejoin the Variation S3-C1 at the end of Segment 3. Variation S3-C5 crosses Mixed Conifer Forest in addition to crossing similar types of vegetation communities as Variation S3-C1. Variation S3-C5 crosses Juniper and Mahogany Woodlands, Mixed Conifer Forest, Mountain Shrub, and Non-native Grasslands to a greater extent, but Tall Sagebrush Steppe to a lesser extent than Variation S3-C1. Variation S3-C5 does cross areas burned by the Cornet-Windy Ridge fire west of Durkee (Links 3-66 and 3-71). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-C5 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S3-C6

Variation S3-C6 follows a more southeasterly alignment than Variation S3-C1, passing due south of Durkee to Pedro Mountain before traveling east to rejoin the Variation S3-C1 at the end of Segment 3. Variation S3-C6 crosses Mixed Conifer Forest and Aspen in addition to crossing similar types of vegetation communities as Variation S3-C1. Variation S3-C5 crosses Aspen, Juniper and Mahogany Woodlands, Mixed Conifer Forest, Mountain Shrub, and RCA vegetation communities to a greater extent, but Tall Sagebrush Steppe to a lesser extent than Variation S3-C1. Variation S3-C6 does cross areas burned by the Cornet-Windy Ridge fire west of Durkee (Link 3-74). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Variation S3-C6 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Flagstaff A Alternative

Vegetation communities crossed by the Flagstaff A Alternative are summarized in Table 3-106. The types of vegetation communities crossed by the Flagstaff A Alternative are similar to those crossed by the Applicant's Proposed Action Alternative, although the Flagstaff A Alternative also crosses Juniper and Mahogany Woodland vegetation communities. The Flagstaff A Alternative crosses lesser amounts of Dwarf Sagebrush Steppe, but greater amounts of Agriculture vegetation communities. The Flagstaff A Alternative crosses areas burned in the Radio Tower Fire (Links 3-48, 3-52, and 3-54), but does not cross any areas burned by wildfire in the 2015 season. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by this wildfire and crossed by the Flagstaff A Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset.

Timber Canyon Alternative

Vegetation communities crossed by the Timber Canyon Alternative are summarized in Table 3-106. The types of vegetation communities crossed by the Timber Canyon Alternative are similar to those crossed by the Applicant's Proposed Action Alternative, although the Timber Canyon Alternative also

crosses Juniper and Mahogany Woodland, Aspen, and Mixed Conifer Forest vegetation communities. The Timber Canyon Alternative crosses lesser amounts of Tall Sagebrush Steppe, but greater amounts of Agriculture, Dwarf Sagebrush Steppe, Mountain Shrub, Non-native Grassland, and RCA vegetation communities. The Timber Canyon Alternative does not cross any areas burned by wildfire during the 2015 season, but passes approximately 0.5 mile from the 2015 Dry Gulch Fire (Link 3-8).

Flagstaff A – Burnt River Mountain Alternative

Vegetation communities crossed by the Flagstaff A – Burnt River Mountain Alternative are summarized in Table 3-106. The types of vegetation communities crossed by the Flagstaff A – Burnt River Mountain Alternative are similar to those crossed by the Applicant's Proposed Action Alternative, although the Flagstaff A – Burnt River Mountain Alternative also crosses Juniper and Mahogany Woodland vegetation communities. The Flagstaff A – Burnt River Mountain Alternative crosses lesser amounts of Native Grassland, but greater amounts of Agriculture, Mountain Shrub, and RCA vegetation communities. The Flagstaff A – Burnt River Mountain Alternative crosses areas burned in the Radio Tower (Links 3-48, 3-52, and 3-54) and Cornet-Windy Ridge fires (Link 3-64). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Flagstaff A – Burnt River Mountain Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset.

Flagstaff B Alternative

Vegetation communities crossed by the Flagstaff B Alternative are summarized in Table 3-106. The types of vegetation communities crossed by the Flagstaff B Alternative are similar to those crossed by the Applicant's Proposed Action Alternative, although the Flagstaff B Alternative also crosses Juniper and Mahogany Woodland vegetation communities. The Flagstaff B Alternative crosses lesser amounts of Dwarf Sagebrush Steppe, but greater amounts of Agriculture vegetation communities. The Flagstaff B Alternative crosses the Radio Tower Fire (Links 3-48, 3-52, and 3-54), but does not cross any areas burned by wildfire in the 2015 season.

Flagstaff B – Burnt River West Alternative

Vegetation communities crossed by the Flagstaff B – Burnt River West Alternative are summarized in Table 3-106. The types of vegetation communities crossed by the Flagstaff B – Burnt River West Alternative are similar to those crossed by the Applicant's Proposed Action Alternative, although the Flagstaff B – Burnt River West Alternative also crosses Juniper and Mahogany Woodland and Mixed Conifer Forest vegetation communities. The Flagstaff B – Burnt River West Alternative crosses lesser amounts of Native Grassland and Tall Sagebrush Steppe, but greater amounts of Non-native Grassland vegetation communities. The Flagstaff B – Burnt River West Alternative crosses areas burned in the Radio Tower (Links 3-48, 3-52, and 3-54) and Cornet-Windy Ridge fires (Links 3-66 and 3-71). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Flagstaff B – Burnt River West Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset

Flagstaff B – Durkee

Vegetation communities crossed by the Flagstaff B – Durkee Alternative are summarized in Table 3-106. The types of vegetation communities crossed by the Flagstaff B – Durkee Alternative are similar to those crossed by the Applicant's Proposed Action Alternative, although the Flagstaff B – Durkee Alternative also crosses Juniper and Mahogany Woodland, Aspen, and Mixed Conifer Forest vegetation communities. The Flagstaff B – Durkee Alternative crosses lesser amounts of Dwarf Sagebrush Steppe and Tall Sagebrush Steppe, but greater amounts of Non-native Grassland, Mountain Shrub, and RCA vegetation communities. The Flagstaff B – Durkee Alternative crosses areas burned in the Radio Tower (Links 3-48, 3-52, and 3-54) and Cornet-Windy Ridge (Link 3-74) fires. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Flagstaff B – Durkee Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset.

Federally Listed and Candidate Plant Species

Table 3-107 summarizes the extent and distribution of known Howell's spectacular thelypody occurrences in the 10-mile analysis corridor. Howell's spectacular thelypody is not known to occur in the 1-mile analysis corridor for the Applicant's Proposed Action Alternative or any alternative route considered in Segment 3.

Table 3-107. Howell's Spectacular Thelypody Occurrences in the 10-mile Analysis Corridor for Segment 3—Baker Valley

Alternative Route	Number of Occurrences
Applicant's Proposed Action	16
Variation S3-A1	*16*
Variation S3-A2	*16*
Variation S3-B1	*8*
Variation S3-B2	*8*
Variation S3-B3	*8*
Variation S3-B4	*8*
Variation S3-B5	*8*
Variation S3-C1	*0*
Variation S3-C2	*0*
Variation S3-C3	*0*
Variation S3-C4	*0*
Variation S3-C5	*0*
Variation S3-C6	*0*
Flagstaff A	16
Timber Canyon	8
Flagstaff A – Burnt River Mountain	16
Flagstaff B	16
Flagstaff B – Burnt River West	16
Flagstaff B – Durkee	16

Applicant's Proposed Action Alternative and All Other Alternatives

Howell's spectacular thelypody is known to occur in the 10-mile analysis corridor for the Applicant's Proposed Action Alternative and other alternative routes considered in Segment 3. The Applicant's Proposed Action Alternative, Variation S3-A1, Variation S3-A2, and all other alternatives except the Timber Canyon Alternative, contain the same eight mapped Howell's spectacular thelypody occurrences in the North Baker Population discussed in Segment 2 as well as an additional eight occurrences located north of Baker, Oregon. These 16 occurrences comprise the entirety of three larger populations, the North Powder, North Baker, and Baldock Slough introduction site populations (USFWS 2010). The Timber Canyon Alternative passes northwest of the North Baker and Baldock Slough introduction site populations and the 10-mile analysis corridor only contains the eight occurrences composing the North Powder population. Similarly, the variations near Baker (Variation S3-B1, Variation S3-B2, Variation S3-B3, Variation S3-B4, and Variation S3-B5) are south of the North Powder population and only include the eight occurrences composing the North Baker and Baldock Slough introduction site populations. The mapped occurrences near Baldock Slough are the closest to the Applicant's Proposed Action Alternative and all other alternative routes except the Timber Canyon Alternative, being approximately 1.9 miles from the Applicant's Proposed Action Alternative (Link 3-4). The closest mapped occurrences to the Timber Canyon Alternative belong to the North Powder population and are located approximately 2.2 miles to the west (Link 3-1).

Other Sensitive Plant Species

Tables 3-108 and 3-109 summarize the extent and distribution of sensitive plant species occurrences in the 1-mile and 10-mile analysis corridors.

Table 3-108. Number of Sensitive Plant Species Occurrences in the 1-mile Analysis Corridor for Segment 3—Baker Valley

Alternative Route	Mingan Moonwort	Cordilleran Sedge	Retrorse Sedge	Hairy Wild Cabbage	White Wooly Buckwheat	Salt Heliotrope	Snake River Goldenweed	Oregon Princesplume
Applicant's Proposed Action	0	0	0	0	8	0	20	5
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C1	*0*	*0*	*0*	*0*	*8*	*0*	*20*	*5*
Variation S3-C2	*0*	*0*	*0*	*1*	*8*	*0*	*20*	*5*
Variation S3-C3	*0*	*0*	*0*	*0*	*0*	*0*	*20*	*0*
Variation S3-C4	*0*	*0*	*0*	*0*	*0*	*0*	*20*	*0*

Table 3-108. Number of Sensitive Plant Species Occurrences in the 1-mile Analysis Corridor for Segment 3—Baker Valley

Alternative Route	Mingan Moonwort	Cordilleran Sedge	Retrorse Sedge	Hairy Wild Cabbage	White Wooly Buckwheat	Salt Heliotrope	Snake River Goldenweed	Oregon Princesplume
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*	*7*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*	*18*	*0*
Flagstaff A	0	0	0	0	8	0	20	5
Timber Canyon	1	4	1	0	3	0	20	2
Flagstaff A – Burnt River Mountain	0	0	0	0	0	0	20	0
Flagstaff B	0	0	0	0	8	0	20	5
Flagstaff B – Burnt River West	0	0	0	0	0	0	7	0
Flagstaff B – Durkee	0	0	0	0	0	0	18	0

Table 3-109. Number of Sensitive Plant Species Occurrences in the 10-mile Analysis Corridor for Segment 3—Baker Valley

Alternative Route	Mingan Moonwort	Mountain Moonwort	Cordilleran Sedge	Retrorse Sedge	Hairy Wild Cabbage	Malheur Cryptantha	White Wooly Buckwheat	Salt Heliotrope	Bank Monkeyflower	Small Phacelia	Snake River Goldenweed	Oregon Princesplume
Applicant's Proposed Action	0	0	0	0	3	1	9	1	0	0	68	5
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*
Variation S3-C1	*0*	*0*	*0*	*0*	*3*	*1*	*9*	*0*	*0*	*0*	*68*	*5*
Variation S3-C2	*0*	*0*	*0*	*0*	*3*	*1*	*9*	*0*	*0*	*0*	*68*	*5*
Variation S3-C3	*0*	*0*	*0*	*0*	*3*	*1*	*9*	*0*	*0*	*0*	*68*	*5*
Variation S3-C4	*0*	*0*	*0*	*0*	*3*	*1*	*9*	*0*	*0*	*0*	*68*	*5*
Variation S3-C5	*0*	*0*	*0*	*0*	*3*	*1*	*5*	*0*	*0*	*0*	*60*	*2*
Variation S3-C6	*0*	*0*	*10*	*0*	*3*	*1*	*2*	*0*	*0*	*0*	*61*	*0*
Flagstaff A	0	0	0	0	3	1	9	1	0	0	68	5
Timber Canyon	6	3	27	1	0	0	8	0	5	7	69	5
Flagstaff A – Burnt River Mountain	0	0	0	0	3	1	9	1	0	0	68	5

Table 3-109. Number of Sensitive Plant Species Occurrences in the 10-mile Analysis Corridor for Segment 3—Baker Valley

Alternative Route	Mingan Moonwort	Mountain Moonwort	Cordilleran Sedge	Retrorse Sedge	Hairy Wild Cabbage	Malheur Cryptantha	White Wooly Buckwheat	Salt Heliotrope	Bank Monkeyflower	Small Phacelia	Snake River Goldenweed	Oregon Princesplume
Flagstaff B	0	0	0	0	3	1	9	1	0	0	68	5
Flagstaff B – Burnt River West	0	0	0	0	3	1	5	1	0	0	60	2
Flagstaff B – Durkee	0	0	10	0	3	1	2	1	0	0	61	0

Applicant's Proposed Action Alternative and All Other Alternatives

Several sensitive plant species are known to occur in the 1-mile and 10-mile analysis corridors for the Applicant's Proposed Action Alternative and all other alternative routes (Tables 3-108 and 3-109). Several of these species are known to occur in the 1-mile and 10-mile analysis corridor only for the Timber Canyon Alternative, while others, including Snake River goldenweed, are present in the 1-mile and 10-mile analysis corridor for every alternative route. The Timber Canyon Alternative contains the greatest number of sensitive species of any alternative route in both the 1-mile and 10-mile analysis corridors. In general, few sensitive species occurrences are known near Baker, Oregon and the route variations in the area (Variation S3-A1, Variation S3-A2, Variation S3-B1, Variation S3-B2, Variation S3-B3, Variation S3-B4, and Variation S3-B5) only contain one occurrence of salt heliotrope in their respective 1-mile and 10-mile analysis corridors.

USFS Sensitive Plant Species

Of the alternative routes and route variations considered in Segment 3, only the Timber Canyon Alternative crosses USFS-administered lands along the foothills of the Wallowa Mountains. Four USFS sensitive plant species are contained in the 10-mile analysis corridor of this alternative, including mountain moonwort, cordilleran sedge, retrorse sedge, and small phacelia. Of these species, only cordilleran and retrorse sedge are known to occur in the 1-mile analysis corridor of the Timber Canyon Alternative.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

Twenty-one species of federal, state, or county listed noxious weeds are known to occur in the study corridor of Segment 3. Many of the mapped weed occurrences are located near Durkee in the southern portion of Segment 3, but also are located throughout Segment 3 in the vegetation resources study corridor for every alternative route. Mapped weed occurrences exist on several vegetation community subtypes, without a clear pattern of distribution based on vegetation community. Large infestations of rush skeletonweed, whitetop, and leafy spurge (*Euphorbia esula*) exist in Segment 3. Both rush skeletonweed and leafy spurge are aggressive invaders of arid, open landscapes, displace native

vegetation, and can cause significant economic impacts on range and agricultural lands (ODA 2015). Most mapped occurrences of rush skeletonweed in Segment 3 are located south of Richland, while most mapped occurrences of leafy spurge are located northeast of Durkee. Whitetop invades a variety of vegetation communities and can form large, monotypic stands where conditions allow (ODA 2015). Mapped whitetop occurrences exist throughout Segment 3, but are mostly near two locations: along the Timber Canyon Alternative near the Wallowa-Whitman National Forest and along I-84 near Burnt River. Other common noxious weeds, Scotch thistle and diffuse knapweed, also are present in the study corridor in Segment 3.

The identified weeds with mapped occurrences include those listed on federal, state, and country noxious weed lists. They do not represent a comprehensive list of every invasive plant species or noxious weed that could potentially occur in Segment 3. A list compiled from state and county noxious weed lists of weeds potentially occurring in the B2H Project area is available in Table D-1 in Appendix D.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

Traditional foods and ethnobotanical resources have the potential to occur along all alternative routes and variations where appropriate vegetation communities exist. Much of the vegetation crossed by alternative routes in Segment 3, particularly the portions near Baker and Durkee, is dominated by Tall Sagebrush vegetation communities likely to support roots, tubers, bulbs and other important ethnobotanical resources. In Segment 3, all alternative routes also cross Native Grassland, Mountain Shrub, and RCA vegetation communities likely to provide several traditional foods and ethnobotanical resources. The Timber Canyon Alternative predominantly crosses Tall Sagebrush Steppe, but also crosses substantial amounts of Mixed Conifer Forest likely to support berries, various moss and fungi, and other ethnobotanical resources.

SEGMENT 4—BROGAN

Vegetation Communities

Table 3-110 presents the resource inventory for all alternative routes and route variations in Segment 4. The distribution of these vegetation communities in Segment 4 is displayed on MV-7.

Applicant's Proposed Action Alternative

The vegetation communities crossed by the Applicant's Proposed Action Alternative in Segment 4 are summarized in Table 3-110. Throughout Segment 4, the Applicant's Proposed Action Alternative predominantly crosses Tall Sagebrush Steppe vegetation communities, but also crosses Native and Non-native Grasslands where the alternative travels north and west of the Willow Creek Valley near Jamieson, Oregon (Links 4-50 and 4-65). The Applicant's Proposed Action Alternative also crosses Bare Ground, Cliffs, Talus, Dwarf Sagebrush Steppe, and Mountain Shrub vegetation communities. The Applicant's Proposed Action Alternative crosses RCA vegetation communities throughout Segment 4, but does not cross any Agriculture or Developed/Disturbed vegetation communities.

Table 3-110. Vegetation Resources Inventory Data for Segment 4—Brogan (miles crossed)																
Alternative Route	**Total Length (miles)**	**Agriculture**	**Aspen**	**Bare Ground, Cliffs, Talus**	**Desert Shrub**	**Developed/Disturbed**	**Dwarf Sagebrush Steppe**	**Forest- Other**	**Juniper and Mahogany Woodland**	**Mixed Conifer Forest**	**Mountain Shrub**	**Native Grasslands**	**Non-Native Grasslands**	**Open Water**	**Riparian Conservation Area**	**Tall Sagebrush Steppe**
Applicant's Proposed Action	40.1	0.0	0.0	1.5	0.0	0.0	1.3	0.0	0.0	0.0	1.3	7.3	8.6	0.0	3.9	16.2
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.4*	*0.3*	*1.7*	*0.0*	*0.7*	*2.6*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*0.0*	*0.0*	*0.0*	*0.7*	*0.2*	*1.7*	*0.0*	*0.6*	*2.3*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.7*	*0.4*	*1.5*	*0.0*	*0.6*	*2.5*
Tub Mountain South	40.5	2.1	0.0	1.8	0.5	0.1	1.3	0.0	0.0	0.0	0.9	1.0	16.3	0.0	4.4	12.1
Willow Creek	34.6	1.0	0.0	1.2	0.0	0.0	0.3	0.0	0.0	0.0	0.4	0.8	9.8	0.0	4.3	16.8

The Applicant's Proposed Action Alternative in Segment 4 crosses areas burned by the 2015 Lime Hill wildfire (Links 4-13, 4-25, and 4-45), as well as smaller areas northwest of Jamieson that burned in the 2014 Brogan Hill wildfire (Link 4-65). The vegetation communities affected by these wildfires may no longer reflect the vegetation community description identified from the NWGAP dataset, particularly areas of Tall Sagebrush Steppe. Tall Sagebrush Steppe vegetation communities can take decades to recover from fire disturbance and may be in an early seral stage dominated by perennial bunchgrasses or shrubs other than big sagebrush, or have transitioned into a community more typical of a Non-native Grassland if invasion by annual grasses and long-term alterations to the fire regime occur (Miller et al. 2013).

Variation S4-A1

Variation S4-A1 follows the same alignment as the Applicant's Proposed Action Alternative at the northern end of the segment and predominantly crosses Tall Sagebrush Steppe and Non-native Grassland vegetation communities. Variation S4-A1 crosses areas burned by the Lime Hill wildfire, as well as several smaller past wildfires (Link 4-13). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S4-A1 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S4-A2

Variation S4-A2 follows a more easterly alignment to allow colocation with an existing transmission line than Variation S4-A1. The types and extents of vegetation communities crossed are similar to Variation S4-A1. Variation S4-A2 also crosses areas burned by the Lime Hill wildfire (Link 4-17), as well as several smaller past wildfires. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S4-A2 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S4-A3

Variation S4-A3 starts west of Variation S4-A2, but travels east and follows the same alignment as Variation S4-A2 for most of the variation. The types and extents of vegetation communities crossed are similar to Variation S4-A1. Variation S4-A3 also crosses areas burned by the Lime Hill wildfire (Link 4-17), as well as several smaller past fires. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S4-A3 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Tub Mountain South Alternative

The vegetation communities crossed by the Tub Mountain South Alternative are summarized in Table 3-110. The types of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative, but the Tub Mountain South Alternative also crosses small amounts of Desert Shrub, Agriculture, and Developed/Disturbed. The Tub Mountain South Alternative would predominantly cross Non-native Grasslands where the alternative route travels east of Jamieson (Link 4-75), and crosses Native Grasslands and Tall Sagebrush Steppe in lesser amounts than the Applicant's Proposed Action Alternative. The Tub Mountain South Alternative crosses areas burned by the 2015 Lime Hill wildfire

(Links 4-13, 4-25, and 4-45), as well as areas near Tub Mountain burned by several large past fires, including the Tub Mountain, Jackson, and Mud Springs wildfires (Link 4-75). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Tub Mountain South Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset.

Willow Creek Alternative

The vegetation communities crossed by the Willow Creek Alternative are summarized in Table 3-110. The types of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative, but the Willow Creek Alternative also crosses Agriculture vegetation communities near Jamieson (Link 4-70). Similar to the Applicant's Proposed Action Alternative, Willow Creek predominantly crosses Tall Sagebrush Steppe and Non-native Grasslands vegetation communities but crosses Native Grasslands to a lesser extent. The Willow Creek Alternative crosses areas burned by the 2015 Lime Hill wildfire (Links 4-13, 4-25, and 4-45), as well as several smaller past fires. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Willow Creek Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Other Alternatives

Federally listed and candidate plant species are not known to occur in the special status plant species study corridor of any alternative in Segment 4.

Other Sensitive Plant Species

Tables 3-111 and 3-112 summarize the extent and distribution of sensitive plant species occurrences in the 1-mile and 10-mile analysis corridors.

Table 3-111. Number of Sensitive Plant Species Occurrences in the 1-mile Analysis Corridor for Segment 4—Brogan

Alternative Route	White Wooly Buckwheat	Cronquist's Stickseed	Janish's Penstemon	Snake River Goldenweed	Oregon Princesplume
Applicant's Proposed Action	1	0	0	9	0
Variation S4-A1	*1*	*0*	*0*	*9*	*0*
Variation S4-A2	*1*	*0*	*0*	*9*	*0*
Variation S4-A3	*1*	*0*	*0*	*8*	*0*
Tub Mountain South	5	7	0	17	0
Willow Creek	1	0	1	13	2

Table 3-112. Number of Sensitive Plant Species Occurrence in the 10-mile Analysis Corridor for Segment 4—Brogan										
Alternative Route	**Tolmie's Onion**	**Mulford's Milkvetch**	**Malheur Cryptantha**	**Shining Flatsedge**	**White Wooly Buckwheat**	**Cronquist's Stickseed**	**Salt Heliotrope**	**Janish's Penstemon**	**Snake River Goldenweed**	**Oregon Princesplume**
Applicant's Proposed Action	0	0	0	0	1	0	0	1	83	7
Variation S4-A1	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*73*	*3*
Variation S4-A2	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*73*	*3*
Variation S4-A3	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*73*	*3*
Tub Mountain South	1	12	1	2	6	38	2	0	78	18
Willow Creek	0	0	0	1	1	1	1	1	77	7

Applicant's Proposed Action Alternative and All Other Alternatives

Several sensitive plant species are known to occur in the 1-mile and 10-mile analysis corridors for the Applicant's Proposed Action Alternative and all other alternative routes (Tables 3-111 and 3-112). Several of these species are known to occur in the 1-mile and 10-mile analysis corridor only for the Tub Mountain South or Willow Creek alternatives, while known occurrences of white wooly buckwheat and Snake River goldenweed exist in the 1-mile and 10-mile analysis corridors for all alternative routes and variations in Segment 4. Oregon princesplume exists in the 10-mile analysis corridor for all alternatives, but only in the 1-mile analysis corridor of the Willow Creek Alternative.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

Fourteen species of federal, state, or county listed noxious weeds are known to occur in the study corridor of Segment 4. Most of these mapped weed occurrences are located near Huntington and the extensive Non-native Grassland vegetation communities along the eastern portion of Segment 4. The Tall Sagebrush Steppe and Native Grassland vegetation communities along the Applicant's Proposed Action Alternative and Willow Creek alternatives have relatively few known mapped weed occurrences. Large infestations of whitetop, spotted knapweed (*Centaurea stoebe*), and rush skeletonweed exist in Segment 4. The whitetop and spotted knapweed infestations occur along Durbin Creek in the northern portion of Segment 4 (Links 4-45, 4-35, and 4-30). Both species can be aggressive and cause significant economic impacts on range and agricultural lands (ODA 2015). Mapped occurrences of rush skeletonweed exist throughout the vegetation resources analysis corridor for the South Tub Mountain Alternative. Other common noxious weeds, Scotch thistle and perennial pepperweed (*Lepidium latifolium*) also are present in the study corridor in Segment 4.

The identified weeds with mapped occurrences include those listed on state and country noxious weed lists. They do not represent a comprehensive list of every invasive plant species or noxious weed that

could potentially occur within Segment 4. A list compiled from federal, state and county noxious weed lists of weeds potentially occurring in the B2H Project area is available in Table D-1 in Appendix D.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

Traditional foods and ethnobotanical resources have the potential to occur along all alternative routes and variations where appropriate vegetation communities exist. Much of the vegetation crossed by alternative routes in Segment 4, particularly the areas south and west of Jamieson, is dominated by Tall Sagebrush Steppe vegetation communities likely to support roots, tubers, bulbs and other important ethnobotanical resources. Large portions of vegetation in Segment 4 have been burned in recent and historic fires, particularly along the Tub Mountain South Alternative, and replaced by Non-native Grassland vegetation communities less likely to support traditional foods and ethnobotanical resources. However, areas supporting traditional foods and ethnobotanical resources may still in exist in areas less affected by fire or in vegetation communities with greater resilience to wildfire disturbance. In Segment 4, all alternative routes also cross Native Grassland, Mountain Shrub, and RCA vegetation communities likely to provide several traditional foods and ethnobotanical resources.

SEGMENT 5—MALHEUR

Vegetation Communities

Table 3-113 presents the resource inventory for all alternative routes and route variations in Segment 5. The distribution of these vegetation communities in Segment 5 is displayed on MV-7.

Applicant's Proposed Action Alternative

The vegetation communities crossed by the Applicant's Proposed Action Alternative in Segment 5 are summarized in Table 3-113. Throughout Segment 5, the Applicant's Proposed Action Alternative predominantly crosses Tall Sagebrush Steppe, but also crosses Non-native Grassland where the alternative route travels southwest of Vale, Oregon (Link 5-1). The Applicant's Proposed Action Alternative also crosses Bare Ground, Cliffs, and Talus and Native Grassland vegetation communities. The Applicant's Proposed Action Alternative crosses RCA vegetation communities throughout Segment 5, and crosses RCAs associated with the Owyhee River downstream of the Lake Owyhee (Link 5-55).

The Applicant's Proposed Action does not cross any areas burned by wildfires in the 2015 season but does cross large areas burned by historic wildfires, including the 2005 Double Mountain, and 2013 Owyhee fires (Links 5-15 and 5-70). The vegetation communities affected by these wildfires may no longer reflect the vegetation community description identified from the NWGAP dataset, particularly areas of Tall Sagebrush Steppe. Tall Sagebrush Steppe vegetation communities can take decades to recover from fire disturbance and may be in an early seral stage dominated by perennial bunchgrasses or shrubs other than big sagebrush, or have transitioned into a community more typical of a Non-native Grassland if invasion by annual grasses and long-term alterations to the fire regime occur (Miller et al. 2013).

Table 3-113. Vegetation Resources Inventory Data for Segment 5—Malheur (miles crossed)																
Alternative Route	**Total Length (miles)**	**Agriculture**	**Aspen**	**Bare Ground, Cliffs, Talus**	**Desert Shrub**	**Developed/Disturbed**	**Dwarf Sagebrush Steppe**	**Forest- Other**	**Juniper and Mahogany Woodland**	**Mixed Conifer Forest**	**Mountain Shrub**	**Native Grasslands**	**Non-Native Grasslands**	**Open Water**	**Riparian Conservation Area**	**Tall Sagebrush Steppe**
Applicant's Proposed Action	40.4	0.0	0.0	7.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.0	10.3	0.0	2.9	18.9
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.9*	*0.0*	*0.5*	*1.4*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.9*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.8*	*0.0*	*0.7*	*1.9*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.0*	*0.7*	*1.4*
Variation S5-B2	*2.8*	*0.6*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*1.1*
Malheur S	43.5	0.0	0.0	6.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	1.2	7.9	0.0	3.9	23.3
Malheur A	43.1	0.0	0.0	6.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	2.0	6.5	0.0	3.8	24.2

Variation S5-A1

Variation S5-A1 follows the same alignment as the Applicant's Proposed Action Alternative in the northern portion of the segment south of Vale and predominantly crosses Non-native Grassland, but also crosses Tall Sagebrush Steppe, RCA, and Bare Ground, Cliffs, and Talus vegetation communities. Variation S4-A1 crosses areas burned by the Double Mountain fire (Link 5-15) for almost the entirety of the variation. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S5-A1 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S5-A2

Variation S5-A2 follows a more southerly alignment than the Applicant's Proposed Action Alternative and predominantly crosses Non-native Grassland, but also crosses Desert Shrub, Tall Sagebrush Steppe, RCA, and Bare Ground, Cliffs, and Talus vegetation communities. Variation S5-A2 also crosses areas burned by the Double Mountain fire (Link 5-20), for almost the entirety of the variation. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S5-A2 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S5-B1

Variation S5-B1 follows the same alignment as the Applicant's Proposed Action Alternative and predominantly crosses Tall Sagebrush Steppe and RCA, but also crosses Bare Ground, Cliffs, and Talus as well as Native and Non-native Grassland vegetation communities. Variation S5-B1 crosses areas burned by the Owyhee fire (Link 5-45), but only for approximately 0.2 mile. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S5-B1 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S5-B2

Variation S5-B2 follows a more northeast alignment to cross the Owyhee River further downriver than the Applicant's Proposed Action Alternative and predominantly crosses Tall Sagebrush Steppe and RCA, but also crosses Bare Ground, Cliffs, and Talus as well Agriculture vegetation communities. Variation S5-B2 crosses areas burned by the Owyhee fire (Link 5-50), but only for approximately 0.4 mile. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S5-B2 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Malheur S Alternative

The vegetation communities crossed by the Malheur S Alternative are summarized in Table 3-113. The types of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative, but the Malheur S Alternative also crosses small amounts of Desert Shrub. The Malheur S Alternative would predominantly cross Tall Sagebrush Steppe, but also cross Non-native Grassland and Bare Ground, Cliff and Talus vegetation communities to a lesser extent than the Applicant's Proposed Action Alternative. The Malheur S Alternative crosses the Owyhee River Below the Dam ACEC (Link 5-30),

which was designated as an ACEC in part due to the rare presence of black cottonwood (*Populus nigra*) galleries in a riverine system. The extent and potential effects on this ACEC are described in greater detail in the Land Use section, Section 3.2.6. The Malheur S Alternative crosses areas burned by the Double Mountain and Owyhee fires (Link 5-25 and 5-30), as well as several smaller past fires. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Malheur S Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset.

Malheur A Alternative

The vegetation communities crossed by the Malheur A Alternative are summarized in Table 3-113. The types of vegetation communities crossed are similar to the Applicant's Proposed Action Alternative, but the Malheur S Alternative also crosses small amounts of Desert Shrub and Dwarf Sagebrush Steppe vegetation communities. The Malheur A Alternative predominantly crosses Tall Sagebrush Steppe, but also cross Non-native Grassland and Bare Ground, Cliff and Talus vegetation communities to a lesser extent than the Applicant's Proposed Action Alternative. The Malheur A Alternative also crosses the Owyhee River Below the Dam ACEC (Link 5-35). The extent and potential effects on this ACEC are described in greater detail in the Land Use section, Section 3.2.6.

The Malheur A Alternative crosses areas burned by the Double Mountain and Owyhee fires Link 5-25 and 5-35), as well as several smaller past fires. Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by these wildfires and crossed by the Malheur A Alternative may no longer reflect the vegetation communities identified in the NWGAP dataset.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Other Alternatives

Federally listed and candidate plant species are not known to occur in the special status plant species study corridor of any alternative route in Segment 5.

Other Sensitive Plant Species

Tables 3-114 and 3-115 summarize the extent and distribution of sensitive plant species occurrences in the 1-mile and 10-mile analysis corridors.

Table 3-114. Number of Sensitive Plant Species Occurrences in the 1-mile Analysis Corridor for Segment 5—Malheur

Alternative Route	Mulford's Milkvetch	Cusick's Pincushion	Malheur Cryptantha	Greeley's Springparsley	Saltwort Buckwheat	Cronquist's Stickseed	Smooth Stickleaf	Wishbone Bush
Applicant's Proposed Action	3	0	4	4	0	6	0	3
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*1*	*2*	*0*	*0*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*
Malheur S	0	2	4	4	0	4	0	2
Malheur A	0	2	0	4	0	4	1	2

Applicant's Proposed Action Alternative and All Other Alternatives

Several sensitive plant species are known to occur in the 1-mile and 10-mile analysis corridors for the Applicant's Proposed Action Alternative and all other alternative routes (Tables 3-114 and 3-115). Several species are known to occur in the 10-mile and 1-mile analysis corridor for only the Applicant's Proposed Action Alternative, while the 1-mile and 10-mile analysis corridors for Malheur S and Malheur A alternatives contain many of the same species and occurrences due to the similar alignment of these two alternative routes. Several sensitive plant species are known to occur in the 1-mile and 10-mile analysis corridor for all alternative routes, usually at the northern and southern ends of the segment where all alternatives follow a similar alignment. The Malheur S and Malheur A alternative routes cross the Owyhee River Below the Dam ACEC established partly to manage Mulford's milkvetch. Potential B2H Project effects on the Owyhee River Below the Dam ACEC are discussed in greater detail in the Land Use section, Section 3.2.6.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

Five species of federal, state, or county listed noxious weeds are known to occur in the vegetation resources study corridor of Segment 5, with mapped occurrences of these weeds located along every alternative route. However, relatively few known weed occurrences are located along the Malheur S and Malheur A alternatives from the junction with the Applicant's Proposed Action Alternative near US Highway 20 south to Grassy Mountain (Link 5-25). Mapped weed occurrences exist in several vegetation communities, without a clear pattern of distribution based on vegetation community. Large infestations of whitetop, rush skeletonweed, and saltcedar (*Tamarix* spp.) exist in the study corridor for all alternative routes in Segment 5. Other common noxious weeds, Scotch thistle and Mediterranean sage (*Salvia aethiopis*) also are present in the vegetation resources study corridor in Segment 5.

Table 3-115. Number of Sensitive Plant Species Occurrences in the 10-mile Analysis Corridor for Segment 5—Malheur

Alternative Route	Barren Milkvetch	Mulford's Milkvetch	Hairy Wild Cabbage	Cusick's Pincushion	Malheur Cryptantha	Greeley's Springparsely	White Wooly Buckwheat	Saltwort Buckwheat	Cronquist's Stickseed	Salt Heliotrope	Seaside Heliotrope	Smooth Stickleaf	Wishbone Bush	Janish's Penstemon	Oregon Princesplume
Applicant's Proposed Action	0	13	1	3	6	9	2	1	39	1	1	7	6	2	3
Variation S5-A1	*0*	*7*	*0*	*0*	*1*	*0*	*0*	*1*	*30*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*6*	*0*	*1*	*1*	*0*	*0*	*1*	*29*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*0*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*7*	*1*	*1*	*0*	*6*	*0*	*0*
Variation S5-B2	*0*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*7*	*1*	*1*	*0*	*6*	*0*	*0*
Malheur S	2	5	1	7	9	9	2	1	15	1	1	7	6	2	3
Malheur A	2	4	1	7	9	9	2	1	15	0	0	7	5	2	3

The identified weeds with mapped occurrences include those listed on federal, state, and country noxious weed lists. They do not represent a comprehensive list of every invasive plant species or noxious weed that could potentially occur within Segment 5. A list compiled from state and county noxious weed lists of weeds potentially occurring in the B2H Project area is available in Table D-1 in Appendix D.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

Traditional foods and ethnobotanical resources have the potential to occur along all alternative routes and variations where appropriate vegetation communities exist. Much of the vegetation crossed by alternative routes in Segment 5 is dominated by Tall Sagebrush Steppe vegetation communities likely to support roots, tubers, bulbs and other important ethnobotanical resources. Large portions of vegetation in Segment 5 have been burned in recent fires, particularly along the Applicant's Proposed Action Alternative southwest of Vale (Link 5-15), and replaced by Non-native Grassland vegetation communities less likely to support traditional foods and ethnobotanical resources. However, areas supporting traditional foods and ethnobotanical resources may still in exist in areas less affected by fire or in vegetation communities with greater resilience to wildfire disturbance. In Segment 5, all alternative routes also cross Native Grassland and Bare Ground, Cliffs and Talus vegetation communities likely to provide several traditional foods and ethnobotanical resources. All alternative routes also cross RCA communities along the Malheur and Owyhee rivers.

SEGMENT 6—TREASURE VALLEY

Vegetation Communities

Table 3-116 presents the resource inventory for all alternative routes and route variations in Segment 6. The distribution of these vegetation communities in Segment 6 is displayed on MV-7.

Applicant's Proposed Action Alternative

The vegetation communities crossed by the Applicant's Proposed Action Alternative in Segment 6 are summarized in Table 3-116. Throughout Segment 6, the Applicant's Proposed Action Alternative predominantly crosses Non-native Grasslands, but also crosses Tall Sagebrush Steppe vegetation communities along the entirety of the alternative. The Applicant's Proposed Action Alternative also crosses Bare Ground, Cliffs, and Talus and RCA vegetation communities throughout Segment 6. The Applicant's Proposed Action Alternative crosses Developed/Disturbed vegetation communities at the Highway 95 crossing (Link 6-25) and Agriculture vegetation communities at the Hemingway terminus near Wilson, Idaho (Link 6-35).

Table 3-116. Vegetation Resources Inventory Data for Segment 6—Treasure Valley (miles crossed)																
Alternative Route	**Total Length (miles)**	**Agriculture**	**Aspen**	**Bare Ground, Cliffs, Talus**	**Desert Shrub**	**Developed/Disturbed**	**Dwarf Sagebrush Steppe**	**Forest- Other**	**Juniper and Mahogany Woodland**	**Mixed Conifer Forest**	**Mountain Shrub**	**Native Grasslands**	**Non-Native Grasslands**	**Open Water**	**Riparian Conservation Area**	**Tall Sagebrush Steppe**
Applicant's Proposed Action	28.0	0.2	0.0	0.9	2.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	2.2	10.5
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.2*	*0.0*	*1.0*	*4.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.2*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.7*	*0.0*	*0.3*	*4.6*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*0.9*	*1.3*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.5*	*0.0*	*0.7*	*5.9*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*1.5*	*0.7*	*0.2*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.3*	*2.9*	*0.0*	*0.8*	*7.6*

The Applicant's Proposed Action crosses areas burned during the 2015 Soda fire for almost the entirety of the route (Links 6-10, 6-25, and 6-35). The burned areas crossed by the Applicant's Proposed Action Alternative were identified as predominantly Non-native Grasslands and Tall Sagebrush steppe in the NWGAP dataset, but the current vegetation communities may no longer match the vegetation communities identified in the NWGAP dataset. Tall Sagebrush Steppe can take decades to recover from fire disturbance and may be in an early seral stage dominated by perennial bunchgrasses or shrubs other than big sagebrush, or transitioning to a stable vegetation community dominated by invasive annual grasses if invasion and reduction in fire-return intervals occurs. The extensive portions of Non-native Grasslands burned by the Soda fire are likely to return to predisturbance conditions within a few years (Miller et al. 2013). However, management efforts by the BLM to restore these areas through treatment of invasive plants, reseeding, grazing management, and other adaptive management strategies are intended to re-establish vegetation communities similar to Native Grasslands or Tall Sagebrush Steppe (BLM 2015).

Variation S6-A1

Variation S6-A1 follows the same alignment as the Applicant's Proposed Action Alternative in the western portion of the segment south of Homedale, Idaho and predominantly crosses Non-native Grassland and Tall Sagebrush Steppe, but also crosses RCA and Desert Shrub vegetation communities. Similar to the Applicant's Proposed Action, almost the entirety of Variation S6-A1 crosses areas burned during the 2015 Soda fire (Links 6-10 and 6-25). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S6-A1 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S6-A2

Variation S6-A2 follows a more northerly alignment than Variation S6-A1 in the western portion of the segment south of Homedale, Idaho but also predominantly crosses Non-native Grassland and Tall Sagebrush Steppe. Variation S6-A2 also crosses Bare Ground, Cliffs, and Talus as well as RCA and Desert Shrub vegetation communities. Similar to Variation S6-A1, almost the entirety of Variation S6-A2 crosses areas burned during the 2015 Soda fire (Links 6-5 and 6-15). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S6-A2 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S6-B1

Variation S6-B1 follows the same alignment as the Applicant's Proposed Action Alternative in the eastern portion of the segment south of Marsing, Idaho, and predominantly crosses Non-native Grassland and Tall Sagebrush Steppe but also crosses Bare Ground, Cliffs, and Talus, Developed/Disturbed, RCA and Desert Shrub vegetation communities. Variation S6-B1 does cross areas burned during the 2015 Soda fire (Link 6-25). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S6-B1 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Variation S6-B2

Variation S6-B2 follows a more southerly alignment than Variation S6-B1 in the eastern portion of the segment south of Marsing, Idaho and also predominantly crosses Non-native Grassland and Tall Sagebrush Steppe, but crosses Tall Sagebrush Steppe to a greater extent than Variation S6-B1. Variation S6-B2 also crosses Juniper and Mahogany Woodland and Native Grasslands, as well as Bare Ground, Cliffs, and Talus, Developed/Disturbed, RCA and Desert Shrub vegetation communities. Variation S6-B2 crosses areas burned during the 2015 Soda fire to a greater extent than Variation S6-B1 (Link 6-30). Similar to the Applicant's Proposed Action Alternative, the vegetation communities affected by wildfire and crossed by the Variation S6-B1 may no longer reflect the vegetation communities identified in the NWGAP dataset.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Variations

Federally listed and candidate plant species are not known to occur in the special status plant species study corridor of alternative route or route variation in Segment 6.

Other Sensitive Plant Species

Tables 3-117 and 3-118 summarize the extent and distribution of sensitive plant species occurrences in the 1-mile and 10-mile analysis corridors.

Table 3-117. Number of Sensitive Plant Species Occurrences in the 1-mile Analysis Corridor for Segment 6—Treasure Valley

Alternative Route	Mulford's Milkvetch	Cusick's Pincushion	Malheur Cryptantha	Greeley's Springparsely	False Naked Buckwheat	Carveseed	Smooth Stickleaf	Janish's Penstemon
Applicant's Proposed Action	1	3	1	8	1	1	4	1
Variation S6-A1	*0*	*2*	*0*	*4*	*0*	*0*	*0*	*0*
Variation S6-A2	*0*	*2*	*0*	*4*	*0*	*0*	*0*	*2*
Variation S6-B1	*0*	*2*	*1*	*0*	*1*	*1*	*4*	*1*
Variation S6-B2	*0*	*2*	*1*	*0*	*1*	*1*	*4*	*1*

Table 3-118. Number of Sensitive Plant Species Occurrences in the 10-mile Analysis Corridor for Segment 6—Treasure Valley

Alternative Route	Idaho Milkvetch	Mulford's Milkvetch	Cusick's Pincushion	Esteve's Pincushion	Malheur Cryptantha	Greeley's Springparsely	Doublet	False Naked Buckwheat	Carveseed	Cronquist's Stickseed	Smooth Stickleaf	Rigid Threadplant	Simpson Hedgehog Cactus	Janish's Penstemon	Owyhee Yellow Phacelia	Water-Thread Pondweed	King's Snapdragon
Applicant's Proposed Action	6	2	6	1	8	9	2	1	5	2	12	1	1	5	2	1	1
Variation S6-A1	*2*	*0*	*4*	*0*	*4*	*9*	*0*	*1*	*2*	*2*	*9*	*0*	*0*	*3*	*0*	*1*	*0*
Variation S6-A2	*2*	*0*	*3*	*0*	*4*	*9*	*0*	*1*	*2*	*2*	*8*	*0*	*0*	*3*	*0*	*0*	*0*
Variation S6-B1	*6*	*1*	*4*	*1*	*4*	*0*	*2*	*1*	*4*	*0*	*4*	*1*	*1*	*2*	*1*	*0*	*1*
Variation S6-B2	*7*	*1*	*4*	*1*	*4*	*0*	*2*	*1*	*4*	*0*	*4*	*1*	*1*	*2*	*1*	*0*	*1*

Applicant's Proposed Action Alternative and All Variations

Several sensitive plant species are known to occur in the 1-mile and 10-mile analysis corridors for the Applicant's Proposed Action Alternative and all other alternative routes (Tables 3-117 and 3-118). All sensitive plant species identified in Segment 6 are known to occur in the 1-mile and 10-mile analysis corridor of the Applicant's Proposed Action. Mulford's milkvetch is known to occur only in the 1-mile analysis corridor of the Applicant's Proposed Action, but all other sensitive plant species also are known to occur in the 1-mile analysis corridor of at least two variations. The 1-mile and 10-mile analysis corridors of Variation S6-B1 and Variation S6-B2 contain the same species and many of the same occurrences due to the similar alignment of these two variations. Similarly, 1-mile and 10-mile analysis corridors of Variation S6-A1 and S6-B1 contain many of the same species and occurrences; however, Variation S6-B2 also contains known occurrences of Janish's penstemon.

Noxious Weeds

Applicant's Proposed Action Alternative and All Variations

11 species of federal, state, or county listed noxious weeds are known to occur in the vegetation resources study corridor of Segment 6. Mapped occurrences of these weeds are located throughout Segment 6 in the study corridor for every alternative route or route variation. Mapped weed occurrences exist in several vegetation community subtypes, without a clear pattern of distribution based on vegetation community. Large infestations of whitetop, Canada thistle, and perennial pepperweed exist in the study corridor for all alternative and variations in Segment 6. Other common noxious weeds, Russian knapweed (*Acroptilon repens*) and Russian olive (*Elaeagnus angustifolia*), also are present in the study corridor in Segment 6.

The identified weeds with mapped occurrences include those listed on federal, state, and country noxious weed lists. They do not represent a comprehensive list of every invasive plant species or noxious weed that could potentially occur in Segment 6. A list compiled from state and county noxious weed lists of weeds potentially occurring in the B2H Project area is available in Table D-1 in Appendix D.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Variations

Traditional foods and ethnobotanical resources have the potential to occur along all alternatives and all variations where appropriate vegetation communities exist. Much of the vegetation crossed by alternative routes in Segment 6 is dominated by Tall Sagebrush Steppe vegetation communities likely to support roots, tubers, bulbs and other important ethnobotanical resources. The Applicant's Proposed Action Alternative and all variations also cross RCA, Desert Shrub, and Bare Ground, Cliffs and Talus communities that also may support traditional foods or ethnobotanical resources. Large portions of vegetation in Segment 6 have been burned in recent fires or replaced by Non-native Grassland vegetation communities and are less likely to support traditional foods or ethnobotanical resources than undisturbed native vegetation communities. However, areas supporting traditional foods and

ethnobotanical resources may still in exist in areas less affected by fire or in vegetation communities with greater resistance and resilience to wildfire disturbance.

3.2.3.6 Environmental Consequences (Results of Analysis)

Types of Potential Effects

Typical direct effects on vegetation resources could include the removal of vegetation communities, loss of vegetation communities supporting traditional foods and other ethnobotanical resources, loss of special status plant species habitat, loss of individuals, and degradation of special status plant habitat through isolation and reduction of patch size. A majority of the direct effects are expected to result from temporary disturbance associated with the initial clearing of construction areas, but permanent loss of vegetation would occur where B2H Project infrastructure (i.e., tower pads, access roads used for maintenance, substation expansion, and communications sites) is expected to exist throughout the lifetime of the B2H Project. As proposed, areas of temporary disturbance will be reclaimed with desirable vegetation communities. However, direct effects on vegetation resources could persist long term, as many species and vegetation communities take decades to recover from disturbance.

The clearing and development of temporary construction areas, as well as construction of B2H Project infrastructure such as access roads, could change local topography and alter hydrologic flow patterns. Any changes to the hydrologic flow patterns may affect vegetation communities or special status plant species dependent on certain hydrologic regimes, where reduced water availability or concentrated flow patterns could adversely affect sensitive vegetation communities or special status plant species and their habitats.

A permanent 250-foot-wide right-of-way would be used for the construction of the 500-kV portions of the line, a 125-foot-wide right-of-way would be used for relocation of an existing 230-kV transmission line in the vicinity of Baker City, Oregon, a 100-foot-wide right-of-way would be used for the 138-kV portions of the line, and a 55-foot-wide right-of-way would be used for the relocation and rebuilding of transmission lines on the NWSTF Boardman (these same widths would be maintained during operation). These widths were established to ensure that sufficient clearance is maintained during high-wind events, when conductors could be blown toward the right-of-way edge, and to allow sufficient room to perform transmission line maintenance. Because the majority of the B2H Project would pass through vegetation communities dominated by low-growing plants (e.g., Agricultural, Grassland, and Shrubland vegetation communities) the entire right-of-way would not be cleared of vegetation in most areas. With the exception of forested areas, construction clearing would be limited to the footprint of B2H Project facilities (e.g., tower bases and substations), access road footprints (i.e., 14 feet wide along straight segments and 16 to 20 feet wide at corners), areas directly adjacent to B2H Project facilities (i.e., an approximately 25-foot perimeter around tower bases), and extra work spaces required for construction (e.g., staging areas, fly yards, and pulling/tensioning sites).

Vegetation maintenance in the right-of-way would be conducted using the wire-border zone method, which controls tall vegetation to different clearance distances based on position within the right-of-way. In general, vegetation at the edge of the right-of-way would grow to greater heights, minimizing the

amount of trees removed. For the most part, the permanent right-of-way would not need maintenance for sufficient clearance, as the majority of the B2H Project crosses through low-lying vegetation. Vegetation maintenance would be needed where the B2H Project crosses woodlands and forested areas and would result in permanent loss of these communities within the 250-foot-wide transmission line right-of-way. The harvest of trees during vegetation clearing and maintenance of the B2H Project right-of-way or other ancillary facilities would be conducted in a manner that meets federal standards on public lands and Oregon's Forest Practices Act standards on private and state lands. Vegetation clearing to maintain the right-of-way would affect Forests/Woodlands vegetation communities but could result in disproportionate impacts on forested wetlands, riparian areas, or old-growth forests, where large, mature trees are crucial to maintaining ecosystem function. The structure of these communities would be altered permanently and habitat values or ecosystem services, or both, of these communities may be affected. Traditional foods or other ethnobotanical resources found in these vegetation communities would also be affected and their availability reduced as a result of vegetation maintenance. Additional indirect effects associated with vegetation maintenance could include increased weed invasion and edge effects, such as increased light availability or increased ambient temperatures and decreased relative humidity associated with removal of canopy shading (Young and Mitchell 1994).

Vegetation clearing and the development of new access roads could promote access to areas previously inaccessible by livestock, vehicles, or general public. Increased public access, vehicle traffic or livestock use could affect native vegetation communities, traditional foods or other ethnobotanical resources and special status by contributing to grazing pressure, soil compaction, illegal collection of special status plants, or increased gathering of traditional foods or other ethnobotanical resources. Additionally, increased vehicle traffic and livestock use could increase the risk of invasive plant species invasion and spread.

The Applicant has committed to not use herbicides to control native vegetation, but herbicides may be used to control invasive plant populations. Herbicide applications could affect native vegetation communities, traditional foods and ethnobotanical resources, and special status plant individuals and habitat through herbicide drift, inadvertent application to nontarget species, or possible spills resulting in site contamination or habitat degradation. Any herbicide application would comply with applicable federal, state, county, or agency guidelines. The herbicides approved for use for all B2H Project activities, as well as herbicide specific buffers for streams, are presented in Section 3.2.5.

Fugitive dust resulting from construction activities and use of B2H Project access roads could result in indirect effects on vegetation resources. Prolonged exposure of plant communities to fugitive dust may affect the growth and reproductive habits of vegetation by reducing photosynthetic abilities and preventing pollen transfer. Fugitive dust could result in decreased availability traditional foods and other ethnobotanical resources by reducing development of roots, leaves, stems, or fruit, as well as rendering some foods unpalatable. Fugitive dust could result in disproportionate effects on federally listed and sensitive plant species due to their limited distribution, small population sizes, or dependence on successful annual reproduction to maintain population sizes. Dust production is expected only during

construction activities and during use of access roads that have not yet revegetated; operation and regular maintenance of the transmission line are not expected to produce significant amounts of dust.

Alterations to soil structure, chemistry, nutrients, hydrology, light availability, and species composition following vegetation clearing or other surface-disturbing activities increase the risk of invasive plant invasion and associated indirect effects on vegetation resources. B2H Project-related construction activities and resulting increased vehicle use on new and improved access roads in the B2H Project area, both by construction machinery and private vehicles, could increase the risk of invasive plants invasion by transporting weed seeds. Seeds may be transported by being lodged directly in vehicles, transported in mud attached to vehicles, and in straw or seed mixes used to reclaim disturbed areas. Noxious weeds and other invasive plants have the potential to displace native vegetation, reduce availability of traditional foods and other ethnobotanical resources, and reduce habitat quality for several federally listed or sensitive plant species (Harrison et al. 1996).

Noxious weeds and other invasive plants invasion can result in permanent alterations in plant community structure, diversity, and function. Indirect effects from weed invasion also may continue long term, as some weed species have the ability to form persistent alternate vegetation communities (Miller et al. 2013). B2H Project disturbance would increase the risk of weed invasion in all vegetation communities and special status plant habitats. The risk and likelihood of weed invasion depends on several factors, including: the extent of B2H Project disturbance, preconstruction condition of native vegetation communities, and distribution of invasive plants in the surrounding area. Relatively intact vegetation communities with low abundances of existing invasive plant infestations would be susceptible to the potential effects of alterations in plant community structure and composition as a result of invasive plant invasion. The risk also varies depending on vegetation community type, as some vegetation communities are highly susceptible to invasion by common invasive plants. Native Grassland and Shrubland communities in the B2H Project area are particularly susceptible to weed invasion based on general high levels of pre-existing disturbance to these communities and abundance of weed species adapted to semi-arid grasslands and shrub-steppe environments.

Common invaders of semi-arid Grassland and Shrubland communities in the B2H Project area of particular concern include cheatgrass (*Bromus tectorum*), medusahead (*Taeniatherum caput-medusae*), diffuse knapweed (*Centaurea diffusa*), and yellow star-thistle (*Centaurea solstitialis*). Riparian and wetland areas identified as RCA vegetation communities also are highly susceptible to weed invasion for similar reasons, and alteration to vegetation composition and structure within these communities could affect other resources as well. Right-of-way clearing and maintenance could increase the weed invasion risk in forested vegetation communities by creating areas favorable to weed establishment and spread not typically found in these communities. Common invaders of RCA and forested vegetation communities in the B2H Project area of particular concern include garlic mustard (*Alliaria petiolate*), Canada thistle (*Cirsium arvense*), and sulfur cinquefoil (*Potentilla recta*). In general, special status plant species and habitat are particularly sensitive to weed invasion based on limited distribution and abundance where any adverse effect or reduced habitat quality could result in larger population effects.

In areas affected by recent fires, vegetation clearing and ground disturbance would be expected to have minimal impacts on the structure of vegetation communities. However, introduction of flammable, invasive annual grasses like cheatgrass or medusahead, in conjunction with ignition risk from increased vehicle use, could increase wildfire frequencies (Whisenant 1990) and sizes (Balch et al. 2012). Frequent fires further increase the susceptibility of an area to invasion by and continued dominance of annual grasses, creating a positive feedback loop. Implementation of the B2H Project could affect local fire regimes through other means, including piling of slash associated with right-of-way clearing and addition of ignition sources from increased traffic on access roads. Wildfire ignition from conductor discharge is not likely with the B2H Project due to the use of steel towers and large conductor spans required for a 500-kV transmission line and ongoing vegetation maintenance in the right-of-way to maintain set clearance distances (CPUC and BLM 2011).

Old-growth forests are rare vegetation communities potentially present in the B2H Project area that provide unique habitats for plant, fungi, and wildlife species and significantly contribute to biodiversity. B2H Project activities that require substantial modification of old-growth forests (i.e., limbing, felling, and clearing of individual trees) would result in changes in forest structure that are either irreversible or persist for several decades. In addition to changes in old-growth forest structure, the types of potential effects on old-growth forests would be similar to those described throughout this section. Any B2H Project-related disturbance to old-growth forests could result in high impacts as they would represent the loss of vegetation communities that are rare, regenerate slowly, or are crucial for maintaining biodiversity (Table 3-94). Additional information about potential effects of the B2H Project on old-growth forests in areas under USFS jurisdiction is presented in Section 3.4.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the environment would remain as it presently exists and no identifiable impacts are expected on any vegetation resource.

EFFECTS COMMON TO ALL ACTION ALTERNATIVES

Disturbance to soil and vegetation in habitat for special status plants could occur as a result of overland vehicle access or foot traffic during geotechnical surveys and preconstruction special status species surveys. Overland vehicle access for geotechnical surveys will be restricted to routes designated in the POD, and special status species surveys would follow agency-approved protocol and would minimize ground disturbance to the extent possible. However, even minimal disturbance in habitat that is rare, highly erodible, or otherwise particularly sensitive could have detrimental effects on a species.

Resource-avoidance measures for the geotechnical investigation would include (1) monitor geotechnical investigation activities, (2) adjust activities to occur outside of seasonal restrictions, (3) use alternative access or drilling methods, (4) relocate the borehole, and (5) abandon the geotechnical site.

SEGMENT 1—MORROW-UMATILLA

Vegetation Communities

Table 3-119 presents the miles crossed and residual impacts on vegetation communities for all alternative routes and route variations in Segment 1. Table 3-120 presents the anticipated amounts of disturbance to vegetation communities in Segment 1. The distribution of vegetation communities in the B2H Project area is displayed on MV-7.

Applicant's Proposed Action Alternative

The vegetation communities crossed, the extent of residual impacts, and the estimated disturbance resulting from the Applicant's Proposed Action Alternative are summarized in Table 3-119. Based on the impact criteria used in this analysis, the Applicant's Proposed Action Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe and Mixed Conifer Forest vegetation communities. Low residual impacts on vegetation communities are expected where the Applicant's Proposed Action Alternative crosses Agriculture and Non-native Grassland communities.

Several wildfires have affected vegetation communities crossed by the Applicant's Proposed Action Alternative on the NWSTF Boardman (Link 1-27), and the current vegetation communities may no longer reflect the vegetation communities identified from the NWGAP data and the assessment of initial and residual impacts. Vegetation communities affected by wildfires can take decades to recover to predisturbance conditions, but are assumed to eventually return to predisturbance conditions, unless weed invasion and fire regime alteration cause native vegetation communities to transition to communities more typical of Non-native Grasslands. The departure from normal of native vegetation communities affected by wildfire is heavily influenced by pre-existing conditions, as well as other factors, including vegetation community type, fire severity, and weather. Vegetation communities with abundant and diverse native plant species, particularly those with high cover of perennial bunchgrasses, are more likely to recruit and resprout with native vegetation similar to predisturbance conditions (Miller et al. 2013). However, without detailed knowledge of the pre-existing conditions across the entirety of the alternative route for each wildfire to predict the departure from normal, the assessment of impacts assumes areas affected by recent wildfires will return to predisturbance conditions. Several B2H Project design features aimed to reduce erosion and the extent of disturbance, prevent the introduction and spread of invasive plants, and establish desirable vegetation are anticipated to minimize the risk of recently burned native vegetation communities transitioning to non-native communities as a result of B2H Project activities.

Table 3-119. Alternative Route Comparison for Vegetation Resources Inventory Data and Residual Impacts on Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Inventory															Residual Impacts[1]	
		Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe	Moderate	Low
Applicant's Proposed Action	91.9	31.5	0.3	0.0	0.4	1.9	0.1	0.1	0.0	13.6	0.2	7.5	4.4	0.0	5.3	26.6	54.0	37.9
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.7*	*0.0*	*0.1*	*0.0*	*0.0*	*0.5*	*0.1*	*6.4*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*5.1*	*0.0*	*0.0*	*0.0*	*0.0*	*1.0*	*0.2*	*6.3*	*0.1*
East of Bombing Range Road	92.3	37.7	0.3	0.0	0.6	0.5	0.1	0.1	0.0	13.6	0.2	7.4	4.7	0.1	5.3	21.7	49.2	43.1
Applicant's Proposed Action – Southern Route	99.1	27.6	0.3	0.0	0.4	1.9	0.4	0.1	0.2	14.7	0.3	11.1	4.9	0.0	6.8	30.4	64.6	34.5
West of Bombing Range Road – Southern Route	95.6	18.9	0.3	0.0	0.3	1.8	0.5	0.1	0.2	14.7	0.3	14.2	5.8	0.0	7.4	31.1	69.0	26.6
Longhorn	88.2	33.4	0.3	0.0	0.2	0.9	0.1	0.1	0.0	13.6	0.2	7.6	5.4	0.2	5.4	20.8	48.2	40.0
Interstate 84	84.7	22.0	0.3	0.0	0.0	12.4	0.1	0.1	0.0	13.6	0.2	6.8	3.9	1.8	10.0	13.5	44.5	40.2
Variation S1-A1	*18.5*	*5.2*	*0.0*	*0.0*	*0.0*	*8.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*1.7*	*0.0*	*1.1*	*1.9*	*3.2*	*15.3*
Variation S1-A2	*18.5*	*5.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.8*	*0.0*	*0.9*	*10.3*	*11.2*	*7.3*
Interstate 84 – Southern Route	93.4	19.5	0.3	0.0	0.0	12.4	0.4	0.1	0.2	14.7	0.3	10.5	4.5	1.8	11.5	17.2	55.1	38.3

Table Note: [1]High residual impacts on vegetation communities are not anticipated to occur.

Table 3-120. Anticipated Disturbance for Vegetation Resources for Segment 1—Morrow-Umatilla (acres)

Alternative Route	Total Disturbance (acres)	Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe
Applicant's Proposed Action	1,907	654	6	0	8	39	2	2	0	282	4	156	91	0	110	552
Variation S1-B1	*142*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*126*	*0*	*2*	*0*	*0*	*11*	*2*
Variation S1-B2	*136*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*109*	*0*	*0*	*0*	*0*	*21*	*4*
East of Bombing Range Road	1,913	782	6	0	12	10	2	2	0	282	4	154	98	2	110	450
Applicant's Proposed Action – Southern Route	2,090	581	6	0	8	40	8	2	4	310	6	234	103	0	143	640
West of Bombing Range Road – Southern Route	2,111	417	7	0	7	40	11	2	4	325	7	314	128	0	163	687
Longhorn	1,867	706	6	0	4	19	2	2	0	288	4	161	114	4	114	440
Interstate 84	1,784	463	6	0	0	261	2	2	0	286	4	143	82	38	210	284
Variation S1-A1	*360*	*101*	*0*	*0*	*0*	*164*	*0*	*0*	*0*	*0*	*0*	*4*	*33*	*0*	*21*	*37*
Variation S1-A2	*408*	*121*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*40*	*0*	*20*	*227*
Interstate 84 – Southern Route	1,989	415	6	0	0	264	9	2	4	313	6	223	96	38	245	366

Table Note: Acres in the table are rounded and, therefore, columns may not sum exactly.

Direct and indirect effects on vegetation communities would include loss of vegetation, alterations to vegetation community structure, and increased risks of invasive plant invasion. The types of potential effects on vegetation communities are described in greater detail in Section 3.2.3.6. Several B2H Project design features are anticipated to limit these effects through reducing the extent of disturbance, preventing the spread and establishment of invasive plants, and reclaiming disturbed areas with desirable native vegetation. Refer to the list of design features applicable to vegetation communities in Table 2-7 in Section 2.3.4.

The Applicant's Proposed Action Alternative crosses RNA-B located on the NWSTF Boardman and would result in disturbance to primarily Tall Sagebrush Steppe vegetation communities in the RNA. The types of effects, initial impacts, and residual impacts on these communities in the RNA would be similar to those described for other vegetation communities in Segment 1. Any development in RNA-B would be inconsistent with the Navy management for the area as identified in the INRMP and underlying governing requirements of designated ecological reserves. Refer to the Land Use section, Section 3.2.6, for a detailed discussion of potential effects regarding Navy management plans.

Where the Applicant's Proposed Action Alternative crosses RCAs, disturbance to these vegetation communities is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible, as described by B2H Project Design Features 15 and 16. Where spanning would not be feasible, the application of several selective mitigation measures aimed to reduce the creation of new access roads, soil disturbance, and vegetation removal in the right-of-way are expected to reduce impacts from a high initial level to a moderate residual level. Reducing vegetation removal in the right-of-way (Selective Mitigation Measure 5) also would be applied to Mixed Conifer Forest, Aspen, and Juniper and Mahogany Woodlands, but is not anticipated to reduce residual impacts. Table 3-116 summarizes the expected level of initial impacts, selective mitigation measures that would be applied, and resulting residual impacts on vegetation communities.

Variation S1-B1

Variation S1-B1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest and RCA vegetation communities. Moderate residual impacts also are expected where Variation S1-B1 crosses Tall Sagebrush Steppe vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S1-B2

Variation S1-B2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest and RCA vegetation communities. Variation S1-B2 would disturb greater amounts of RCAs than Variation S1-B1. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The types of effects associated with the relocation of the existing transmission line would be similar to those described in Section 3.2.3.6. Direct and indirect effects from Design Option 1 will result in impacts on vegetation communities, but B2H Project design features and selective mitigation measures are expected to limit and reduce residual impacts. The anticipated levels of residual impacts on vegetation communities and applicable design features and selective mitigation measures are summarized in Table 3-95. The types of vegetation communities affected and the extent of impacts resulting from the additional action will depend on the several factors, including the amount of ground clearing needed to safely address unexploded ordnance on the NWSTF Boardman while decommissioning the line and the relocation area.

Design Option 2

The types of effects associated with the relocation of the existing transmission line would be similar to those described in Section 3.2.3.6. Direct and indirect effects from the additional action according to Design Option 2 will result in greater amounts of impacts on vegetation communities than Design Option 1. Design Option 2 requires decommissioning more of the existing 69-kV transmission line and constructing a longer transmission line to replace the 69-kV transmission line. B2H Project design features and selective mitigation measures are expected to limit and reduce residual impacts. The anticipated levels of residual impacts on vegetation communities and applicable design features and selective mitigation measures are summarized in Table 3-95. The types of vegetation communities affected and the extent of impacts resulting from the additional action will depend on the several factors, including the amount of ground clearing needed to safely address unexploded ordnance on the NWSTF Boardman while decommissioning the line and the relocation area.

Design Option 3

The types of effects associated with the relocation of the existing transmission line would be similar to those described in (Section 3.2.3.6. Direct and indirect effects from Design Option 3 would result in greater amounts of impacts on vegetation communities than either Design Option 1 or Design Option 2. Design Option 3 requires the same extent of decommissioning for the existing 69-kV transmission line and construction of a replacement transmission line as Design Option 2, but also requires the additional construction of a new step-down station. The disturbance to vegetation communities associated with constructing the 230-kV transmission line required by Design Option 3 would occur regardless of whether the Applicant or another entity constructs the transmission line and, therefore, is included this analysis. B2H Project design features and selective mitigation measures are expected to limit and reduce residual impacts. The anticipated levels of residual impacts on vegetation communities and applicable design features and selective mitigation measures are summarized in Table 3-95. The types of vegetation communities affected and the extent of impacts resulting from the additional action will depend on the several factors, including the amount of ground clearing needed to safely address unexploded ordnance on the NWSTF Boardman while decommissioning the line and the relocation area.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe and Mixed Conifer Forest vegetation communities. Moderate impacts also are anticipated where the alternative route crosses RCAs and Native Grasslands. Low residual impacts on vegetation communities are expected where the East of Bombing Range Road Alternative crosses Agriculture and Non-native Grassland communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe, Mixed Conifer Forest, and Native Grassland vegetation communities. Moderate impacts also are anticipated where the alternative route crosses RCAs. Low residual impacts on vegetation communities are expected where the Applicant's Proposed Action – Southern Route Alternative crosses Agriculture and Non-native Grassland communities. The Applicant's Proposed Action – Southern Route Alternative crosses RNA-B on the NWSTF along the same alignment as the Applicant's Proposed Action Alternative and would result in the same impacts on vegetation communities in RNA-B. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

The types of effects associated with the relocation of the existing transmission line for the Applicant's Proposed Action – Southern Route Alternative would be similar to those described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe, Mixed Conifer Forest, and Native Grassland vegetation communities. Moderate impacts also are anticipated where the alternative route crosses RCAs. Low residual impacts on vegetation communities are expected where the West of Bombing Range Road – Southern Route Alternative crosses Agriculture and Non-native Grassland communities. The West of Bombing Range Road – Southern Route Alternative crosses RNA-B on the NWSTF along the same alignment as the Applicant's Proposed Action Alternative and would result in the same impacts on vegetation communities in the RNA. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to

reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

The types of effects associated with the relocation of the existing transmission line for the West of Bombing Range Road – Southern Route Alternative would be similar to those described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Longhorn Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe and Mixed Conifer Forest vegetation communities. Moderate impacts also are anticipated where the alternative route crosses RCAs and Native Grasslands. Low residual impacts on vegetation communities are expected where the Longhorn Alternative crosses Agriculture and Non-native Grassland communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

The Interstate 84 Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe, Mixed Conifer Forest, and RCA vegetation communities. Low residual impacts on vegetation communities are expected where the Interstate 84 Alternative crosses Agriculture and Non-native Grassland communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative. As a result of the greater amounts of disturbance to non-native vegetation communities, the Interstate 84 Alternative is anticipated to have lower levels of residual impacts on vegetation communities than the Applicant's Proposed Action Alternative.

Variation S1-A1

Variation S1-A1 is anticipated to result in predominantly low residual impacts on vegetation communities as it primarily crosses Developed/Disturbed and Agriculture vegetation communities. Moderate residual impacts are anticipated where Variation S1-A1 crosses Tall Sagebrush Steppe and RCAs. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S1-A2

Variation S1-A2 is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe and RCA vegetation communities. Low residual impacts are anticipated where Variation S1-A2 crosses Agriculture vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and

selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe, Mixed Conifer Forest, and RCA vegetation communities. Low residual impacts on vegetation communities are expected where the Interstate 84 – Southern Route Alternative crosses Agriculture and Non-native Grassland communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Other Alternatives

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor. As such, impacts resulting from short-term disturbance, loss or adverse modification of habitat occupied by federally listed or candidate species, or individual mortality to federally listed or candidate species are not anticipated for any alternative routes considered in Segment 1. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance and prevent individual mortality in occupied habitat is anticipated to reduce residual impacts on federally listed or candidate plant species to low levels.

Other Sensitive Plant Species

Table 3-121 identifies the sensitive plant species known to occur in the 1-mile analysis corridor for all alternative routes and route variations in Segment 1, and summarizes the occurrence data by land-management jurisdiction and known occurrences in the 10-mile analysis corridor.

Table 3-121. Potentially Affected Sensitive Plant Species for Segment 1—Morrow-Umatilla

Alternative Route	Total Acres of Disturbance	Laurent's Milkvetch					Retrorse Sedge				
		Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile			
			Federal	State	Private	Total		Federal	State	Private	Total
Applicant's Proposed Action	1,907	16	1	0	10	10	0	0	0	0	0
Variation S1-B1	*142*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*136*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	1,913	16	1	0	10	10	0	0	0	0	0
Applicant's Proposed Action – Southern Route	2,090	16	1	0	10	10	0	0	0	0	0

Table 3-121. Potentially Affected Sensitive Plant Species for Segment 1—Morrow-Umatilla

Alternative Route	Total Acres of Disturbance	Laurent's Milkvetch					Retrorse Sedge				
		Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile			
			Federal	State	Private	Total		Federal	State	Private	Total
West of Bombing Range Road – Southern Route	2,111	9	1	0	1	1	0	0	0	0	0
Longhorn	1,867	16	0	0	9	9	0	0	0	0	0
Interstate 84	1,784	6	0	0	2	2	1	0	0	0	0
Variation S1-A1	*360*	*2*	*0*	*0*	*2*	*2*	*1*	*0*	*0*	*0*	*0*
Variation S1-A2	*408*	*3*	*0*	*0*	*1*	*1*	*1*	*0*	*0*	*1*	*1*
Interstate 84 – Southern Route	1,989	6	0	0	2	2	1	0	0	0	0

Table Note: Some sensitive plant species occurrences may exist on multiple jurisdictions, and the sum of occurrences on federal, state, and private lands may be greater than the total

Applicant's Proposed Action Alternative

One sensitive plant species occurs in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, Laurent's milkvetch (Table 3-121).

If disturbance from B2H Project activities occurs in sensitive plant species habitats, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion or reduction and isolation of patch size. These effects are described in greater detail in Section 3.2.3.6. The criteria used to assess impacts are presented in Table 3-94.

Temporary disturbance to sensitive plant species and habitats, such as dust deposition or decreased pollinator attractiveness, could result in effects on individuals through reduced reproductive and photosynthetic activities which would adversely affect the ability of sensitive plant species to recover from disturbance. Where disturbance results in these temporary effects, low levels of impacts are expected. Disturbance to sensitive plant species and habitats could result in long-term effects where habitat loss and degradation through isolation or increased risk of weed invasion adversely affect the species ability to recover from disturbance and reduce available habitat. Where disturbance results in these long-term effects, moderate levels of impacts are expected.

Disturbance to sensitive plant species resulting in the mortality of individuals and loss of habitat could reduce local populations, leading to (1) increased vulnerability to stochastic events, (2) genetic inbreeding and depression, (3) limited effectiveness of future restoration actions, and (4) decreased ability of local populations to persist in the long term. Where disturbance results in limited or incidental mortality of sensitive plant species that does not affect the long-term persistence of local populations, low levels of impacts are expected. If reduction of the local population is severe and contributes the extirpation of a local sensitive plant species population, moderate impacts are expected. If the extirpation of a local sensitive plant species population occurs and adversely affects sensitive plants

species contributing to the listing of the species under the ESA for additional protection, high levels of impact are expected.

If impacts on sensitive plant species and their habitat do occur, the severity of impacts would also depend on the sensitive plant species affected and the broader distribution of known occurrences throughout the range of the species. In general, sensitive plant species are rare, with relatively few known occurrences, and any disturbance to sensitive species and their habitat will disproportionately impact the species. Similarly, disturbance to sensitive plant species with limited distribution or few known occurrences are likely to result in greater impacts than disturbance to a more broadly distributed species.

The severity of potential impacts also depends on the species affected; as different life histories and adaptations will determine the sensitive plant species tolerance and ability to recover from disturbance. Disturbance to sensitive plant species that are less tolerant to disturbance through adaptations such as required cross-pollination through insects for successful reproduction, are likely to be more severely affected by dust deposition than self-pollinating plant species. Similarly, disturbance to sensitive plant species with life histories reducing the species' ability to recover from disturbance, such as slow-maturing perennial species, are likely to be more severely affected by disturbance or individual mortality.

Due to the complicated nature of assessing impacts on sensitive plant species, the state rank as determined by the state natural heritage program, as well as the number of known occurrences for each species, is provided as an estimate of the species' vulnerability to disturbance. Species ranked as higher conservation concern, or with fewer known occurrences, are assumed to be more sensitive, and any B2H Project-related disturbance would have greater impacts on these species.

However, impacts on sensitive plant species are anticipated to be largely avoided through application of design features of the B2H Project for environmental protection and selective mitigation measures. Design Feature 4 requires that preconstruction surveys be conducted for sensitive plant species. In areas determined to be occupied by sensitive plant species, Selective Mitigation Measures 8 and 13 would be applied to span, avoid, or reduce disturbance in sensitive plant species habitat and limit any mortality of individuals. In addition, design features of the B2H Project for environmental protection aimed to reduce the amounts of disturbance and prevent the establishment of invasive plants would limit residual impacts on sensitive plant species.

Several known occurrences of these species in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative exist on federally managed lands where resource management plans require the conservation of sensitive species and implementation of the B2H Project will be designed to reduce, avoid or mitigate any potential impacts on sensitive plant species (Table 3-121). However, some occurrences are primarily on private land where pre-existing disturbance may have increased the occurrence's vulnerability to disturbance through loss and degradation of suitable habitat or population reductions. On privately owned lands, implementation of the B2H Project may not need to comply with resource management plans requiring the reduction of impacts on sensitive plant species. Depending

on the amount of pre-existing disturbance and individual landowner preferences regarding survey access, placement of B2H Project features, and herbicide application during B2H Project construction, operation, and maintenance, impacts on sensitive plant species occurring on privately owned lands may be greater than expected on federally managed lands and result in loss of habitat; mortality or other adverse effects on individuals; habitat degradation through weed invasion, and severe reductions in local populations. Due to EFSC regulation, the B2H Project would comply with state of Oregon regulations protecting sensitive plant species considered endangered or threatened by the state of Oregon regardless of land jurisdiction. As a result, implementation of the B2H Project on private lands would be managed to prevent a significant reduction in the likelihood of survival or recovery of the species.

Laurent's milkvetch is a perennial forb considered critically imperiled by ORBIC (G5T1S1) due to the few known occurrences limited to north-central Oregon (ORBIC 2013a). Most known occurrences are small, with fewer than 100 individuals per occurrence and patchily distributed in a landscape with extensive agricultural development. Population trends are unknown, but due to the small number of known occurrences and existing threats from agricultural development would be sensitive to disturbance. ORBIC recognizes 29 occurrences of Laurent's milkvetch in Oregon. However, 12 occurrences were identified preconstruction surveys. Of the total 41 known Laurent's milkvetch occurrences, 10 are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. All 10 of these occurrences exist on privately owned lands. However this species is considered threatened by the state of Oregon; and potential impacts resulting from the B2H Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the total number of occurrences, compliance with state of Oregon regulations on private lands, and the mitigation measures to avoid or reduce disturbance there would be limited impacts on the species. Implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance to Laurent's milkvetch and moderate residual impacts, but is not likely to contribute to the need to list the species under the ESA.

Until the final engineering design and preconstruction surveys completed is available, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative determination of the number of individuals affected, acres of habitat disturbed, or anticipated amount of impacts on sensitive plant species cannot be provided.

Variation S1-B1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S1-B1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S1-B2

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S1-B2, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Additional Action – 69-Kilovolt Line Replacement

Direct and indirect effects from the additional action may result in impacts on sensitive plant species similar to those described for the Applicant's Proposed Action Alternative. Application of selective mitigation measures based on the results of preconstruction surveys is anticipated to reduce impacts on sensitive plant species.

East of Bombing Range Road Alternative

The 1-mile analysis corridor for the East of Bombing Range Road Alternative contains the same sensitive species and number of known occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the East of Bombing Range Alternative could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Applicant's Proposed Action – Southern Route Alternative

The 1-mile analysis corridor for the Applicant's Proposed Action – Southern Route Alternative contains the same sensitive species and number of known occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Applicant's Proposed Action – Southern Route Alternative could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

The types of potential effects, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Additional Action – 69-Kilovolt Line Replacement

The types of effects associated with the relocation of the existing transmission line for the Applicant's Proposed Action – Southern Route Alternative would be similar to those described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The 1-mile analysis corridor for the West of Bombing Range Road – Southern Route Alternative contains the same sensitive species but fewer known occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the West of Bombing Range Road – Southern Route Alternative could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Additional Action – 69-Kilovolt Line Replacement

The types of effects associated with the relocation of the existing transmission line for the West of Bombing Range Road – Southern Route Alternative would be similar to those described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The 1-mile analysis corridor for the Longhorn Alternative contains the same sensitive species but fewer known occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Longhorn Alternative could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Interstate 84 Alternative

The 1-mile analysis corridor for the Interstate 84 Alternative contains the same sensitive species but eight fewer known occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Interstate 84 Alternative could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the

need to list the species under the ESA. However, given the fewer number of occurrences contained in the 1-mile analysis corridor of the Interstate 84 Alternative, the likelihood of moderate residual impacts resulting from implementation is less than the Applicant's Proposed Action Alternative.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S1-A1

The 1-mile analysis corridor for Variation S1-A1 contains the same sensitive species but fewer known occurrences as the Interstate 84 Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S1-A1 could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Interstate 84 Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys

Variation S1-A2

The analysis corridor for Variation S1-A2 contains two species: Laurent's milkvetch and retrorse sedge.

Retrorse sedge is a perennial graminoid considered critically imperiled (G5S1) due to the limited number of occurrences in Oregon (ORBIC 2013a). Population trends are unknown in Oregon. Retrorse sedge is known from only a few locations in Oregon with only two located east of the Cascades, but broadly distributed across northern North America. ORBIC recognizes 9 occurrences of retrorse sedge. However, 1 other occurrence was identified during other USFS surveys and none known from Idaho. Of the 10 total occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by implementation of Variation S1-A2. This occurrence exists on privately owned land where impacts resulting from the B2H Project may be greater. However, based on the number of total known occurrences and the broader distribution of the species beyond the B2H Project area, implementation of Variation S1-A2 could result in long-term disturbance to retrorse sedge and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S1-A2 could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's

Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Interstate 84 – Southern Route Alternative

The 1-mile analysis corridor for the Interstate 84 – Southern Route Alternative contains the same sensitive species but fewer known occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Interstate 84– Southern Route Alternative could result in moderate residual impacts on Laurent's milkvetch, but is not likely to contribute to the need to list the species under the ESA. However, given the fewer number of occurrences contained in the 1-mile analysis corridor of the Interstate 84 – Southern Alternative, the likelihood of moderate residual impacts resulting from implementation is less than the Applicant's Proposed Action Alternative.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

USFS Sensitive Plant Species

The Applicant's Proposed Action Alternative and all other alternative routes cross USFS-administered land and contain USFS sensitive plant species in their respective 10-mile analysis corridors. However, of the four USFS sensitive plant species known to occur in the 10 mile analysis corridor of alternatives and variations crossing USFS-administered lands, only scabland penstemon and flowery phlox occur in the Blue Mountains region where the alternatives and variations cross USFS-administered lands. The known occurrences of salt heliotrope and retrorse sedge are north and west of Pendleton and are more than 40 miles from USFS-administered lands. Scabland penstemon and flowery phlox are not known to occur in the 1-mile analysis corridor of any alternative or variation crossing USFS-administered lands, and direct or indirect effects resulting from B2H Project-related activities are not expected to affect these known occurrences.

Unknown occurrences of USFS sensitive plant species may exist on USFS-administered lands that would be crossed by the B2H Project. As required by B2H Project Design Feature 4, preconstruction surveys to identify USFS sensitive species and determine habitat extents would be conducted along the right-of-way, as well as any areas requiring ground disturbance (e.g., building or upgrading of access roads, temporary work areas, and multi-use areas) outside the right-of-way.

If disturbance resulting from B2H Project activities occurs in USFS sensitive plant species habitats, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion or reduction and isolation of patch size. These effects are described in greater detail in Section 3.2.3.6. Based on the impact criteria, moderate levels of residual impacts are anticipated if B2H Project activities result in the mortality of individuals

and low levels of residual impacts are anticipated if temporary disturbance to sensitive plant species occurs. However, impacts on USFS sensitive plant species are anticipated to be largely avoided through application of design features of the B2H Project for environmental protection and selective mitigation measures. Design Feature 4 requires that preconstruction surveys be conducted for sensitive plant species. In areas determined to be occupied by USFS sensitive plant species, Selective Mitigation Measures 8 and 13 would be applied to span, avoid, or reduce disturbance in occupied habitat. In addition, design features of the B2H Project for environmental protection aimed to reduce the amounts of disturbance and prevent the establishment of invasive plants would limit direct and indirect effects on USFS sensitive plant species.

However, until the final engineering design and the results of preconstruction surveys are available, the exact location of USFS sensitive plant species in relation to B2H Project features is not available and a quantitative determination of the number of individuals affected, acres of habitat disturbed, or anticipated amount of impacts on sensitive plant species cannot be provided. The application of several B2H Project design features and selective mitigation measures is anticipated minimize direct and indirect effects on USFS sensitive plant species. Implementation of the B2H Project may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species for any of the USFS sensitive plant species considered in Segment 1.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes would result in disturbance to native vegetation communities, which could alter vegetation community structure, soil properties, and water availability creating conditions favorable for noxious weed establishment and spread. Where this disturbance is in areas without weed infestations, the B2H Project may introduce noxious weed species through the transport of plant materials. In Segment 1, these areas exist mostly south of Pendleton and Interstate 84 and are crossed by the Applicant's Proposed Action – Southern Route, West of Bombing Range Road – Southern Route, and Interstate 84 – Southern Route alternative routes (Links 1-62, 1-64, and 1-66). Noxious weeds can displace native vegetation, reduce habitat quality for plant and wildlife species, and adversely affect agricultural operations by contaminating crops or degrading range and pastures. The potential impacts associated with noxious weeds on vegetation resources are described in greater detail in Section 3.2.3.6.

The extent of noxious weed invasion would be influenced by several factors, including the extent of B2H Project disturbance, preconstruction condition of native vegetation communities, and the distribution of noxious weeds in the surrounding area. The anticipated amounts of B2H Project disturbance to vegetation communities are summarized in Table 3-120. Several design features of the B2H Project for environmental protection aimed to limit disturbance extent or reclaim disturbed areas are expected to reduce noxious weed invasion potential. In addition to the design features, the Applicant has committed to developing a Noxious Weed Management Plan that will detail preconstruction surveys, weed-control measures, and postconstruction monitoring. Implementation of

this plan would be expected to prevent the spread and establishment of noxious weeds and reduce impacts on vegetation resources associated with noxious weeds.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes would result in disturbance and potential impacts on native vegetation communities (Table 3-120). The Applicant's Proposed Action, West of Bombing Range Road, Applicant's Proposed Action – Southern Alternative crosses the NWSTF Boardman (Link 1-27) and could result in disturbance to vegetation communities supporting traditional foods and other ethnobotanical resources identified in the 2013 CTUIR ethnobotanical surveys. The types of potential impacts are described in greater detail in Section 3.2.3.6, but could include permanent and temporary loss of native vegetation communities, increased risk of weed invasion, and increased dust deposition. These types of effects could adversely affect an areas' ability to support traditional food or ethnobotanical resources and may result in temporary decreases in their abundance. Design features of the B2H Project aimed to reduce the amounts of disturbance and prevent the establishment of invasive plants would limit impacts on traditional foods and ethnobotanical resources. Additional design features requiring spanning, avoidance, and minimizing disturbance to RCA vegetation communities are anticipated to largely avoid impacts on traditional foods and ethnobotanical resources found in these vegetation communities. Once final engineering design is available, mitigation specific to areas important for the gathering of traditional foods and ethnobotanical resources can be identified and addressed in the government to government consultation process.

Conclusion

The Applicant's Proposed Action Alternative and all other alternative routes considered in Segment 1 would result in predominantly moderate residual impacts on vegetation communities, with the Interstate 84 Alternative resulting in the least moderate residual impacts as it affects Developed/Disturbed vegetation communities to the greatest extent. Several alternative routes would result in impacts on the NWSTF Boardman and the RNA (RNA-B) established to protect the few remaining intact native vegetation communities in the region. These alternative routes include: the Applicant's Proposed Action Alternative, the Applicant's Proposed Action – Southern Route Alternative, and the West of Bombing Range Road – Southern Route Alternative. The above alternative routes would also impact traditional foods and ethnobotanical resources on the NWSTF Boardman important to tribal groups.

Impacts on federally listed species are not expected for any of the alternative routes in Segment 1. Moderate residual impacts on sensitive plant species could occur for all alternative routes considered. The 1-mile analysis corridors of Interstate 84 and Interstate 84 – Southern Route alternatives contain the fewest occurrences of Laurent's milkvetch and have the lowest likelihood of moderate residual impacts on sensitive plant species. Variation S1-A1 would result in fewer impacts on sensitive plant species than Variation S1-A2, which could affect the only occurrence of retrorse sedge in Segment 1.

All alternative routes would result in disturbance to native vegetation communities and increase the potential establishment and spread of noxious weeds and other invasive plants. The Applicant's

Proposed Action – Southern Route, West of Bombing Range Road – Southern Route, and Interstate 84 – Southern Route alternative routes cross areas with few identified noxious weed infestations, and could introduce noxious weeds and other invasive plants to these areas.

The Interstate 84 Alternative would result in the least impacts on vegetation resources overall compared to the other alternative routes in Segment 1 due to (1) the fewest anticipated impacts on vegetation communities, (2) the lowest likelihood of moderate impacts on sensitive plants, and (3) the lower potential of introducing noxious weeds or other invasive plants to undisturbed areas.

SEGMENT 2—BLUE MOUNTAINS

Vegetation Communities

Table 3-122 presents the miles crossed and residual impacts on vegetation communities for all alternative routes and route variations in Segment 2. Table 3-123 presents the anticipated amounts of disturbance to vegetation communities in Segment 2. The distribution of vegetation communities in the B2H Project area is displayed on MV-7.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Mixed Conifer, Mountain Shrub, and Tall Sagebrush vegetation communities. Low residual impacts on vegetation communities are expected where the Applicant's Proposed Action Alternative crosses Agriculture and Non-native Grassland communities.

Direct and indirect effects on vegetation communities would include loss of vegetation, alterations to vegetation community structure, and increased risks of invasive plant invasion. The types of potential effects on vegetation communities are described in greater detail in Section 3.2.3.6. Several design features of the B2H Project for environmental protection are anticipated to limit these effects through reducing the extent of disturbance, preventing the spread and establishment of invasive plants, and reclaiming disturbed areas with desirable native vegetation. Refer to the list of design features applicable to vegetation communities in Section 3.2.3.4.

Where the Applicant's Proposed Action Alternative crosses RCAs, disturbance to these vegetation communities is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible, as described by B2H Project Design Features 15 and 16. Where spanning would not be feasible, the application of several selective mitigation measures aimed to reduce the creation of new access roads, soil disturbance, and vegetation removal in the right-of-way are expected to reduce impacts from a high initial level to a moderate residual level. Reducing vegetation removal in the right-of-way (Selective Mitigation Measure 5) also would be applied to Mixed Conifer Forest, Aspen, and Juniper and Mahogany Woodlands but is not anticipated to reduce residual impacts. Table 3-95 summarizes the expected level of initial impacts, selective mitigation measures that would be applied, and resulting residual impacts on vegetation communities.

Table 3-122. Vegetation Resources Inventory Data and Residual Impacts on Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length (miles)	Inventory															Residual Impacts[1]	
		Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe	Moderate	Low
Applicant's Proposed Action	33.8	0.3	0.2	0.0	0.0	0.0	0.1	0.0	1.1	10.1	7.1	1.7	0.1	0.0	5.0	8.1	33.4	0.4
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.4*	*0.2*	*0.9*	*0.0*	*0.0*	*0.1*	*0.2*	*2.8*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.5*	*0.2*	*0.6*	*0.0*	*0.0*	*0.6*	*0.0*	*2.9*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*1.2*	*1.4*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*	*3.7*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.4*	*0.7*	*0.0*	*0.0*	*0.0*	*1.0*	*0.7*	*3.8*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*5.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.5*	*2.8*	*9.3*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.7*	*4.7*	*0.1*	*0.0*	*0.0*	*0.0*	*0.8*	*2.4*	*8.8*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.2*	*0.5*	*0.0*	*0.0*	*0.0*	*0.3*	*0.3*	*2.3*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.8*	*0.3*	*0.0*	*0.0*	*0.0*	*0.2*	*0.9*	*2.6*	*0.0*
Variation S2-F1	*12.1*	*0.3*	*0.2*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.1*	*3.8*	*0.8*	*0.1*	*0.0*	*2.3*	*4.4*	*11.7*	*0.4*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.2*	*0.0*	*0.2*	*0.0*	*2.7*	*0.6*	*0.1*	*0.0*	*1.6*	*6.7*	*12.0*	*0.2*
Glass Hill	33.7	0.3	0.2	0.2	0.0	0.0	0.1	0.0	1.3	8.9	7.9	1.7	0.1	0.0	5.4	7.6	33.1	0.6
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.0*	*2.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.4*	*4.3*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.4*	*0.0*	*0.6*	*0.1*	*0.0*	*0.8*	*0.2*	*4.0*	*0.1*
Mill Creek	34.0	0.2	0.0	0.0	0.0	0.1	0.2	0.0	1.3	7.3	6.9	1.8	0.3	0.0	4.6	11.3	33.4	0.6

Table Note: [1]High residual impacts on vegetation communities are not anticipated to occur.

Table 3-123. Anticipated Disturbance for Vegetation Resources for Segment 2—Blue Mountains (acres)

Alternative Route	Total Disturbance (acres)	Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe
Applicant's Proposed Action	764	7	5	0	0	0	2	0	25	230	161	39	2	0	114	184
Variation S2-A1	*58*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*28*	*4*	*18*	*0*	*0*	*2*	*4*
Variation S2-A2	*60*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*31*	*4*	*12*	*0*	*0*	*12*	*0*
Variation S2-B1	*85*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*28*	*33*	*0*	*0*	*0*	*24*	*0*
Variation S2-B2	*85*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*31*	*16*	*0*	*0*	*0*	*22*	*16*
Variation S2-C1	*221*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*21*	*119*	*2*	*0*	*0*	*0*	*12*	*67*
Variation S2-C2	*191*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*15*	*102*	*2*	*0*	*0*	*0*	*17*	*52*
Variation S2-E1	*52*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*27*	*11*	*0*	*0*	*0*	*7*	*7*
Variation S2-E2	*58*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*9*	*18*	*7*	*0*	*0*	*0*	*4*	*20*
Variation S2-F1	*260*	*6*	*4*	*0*	*0*	*0*	*2*	*0*	*0*	*2*	*82*	*17*	*2*	*0*	*49*	*95*
Variation S2-F2	*266*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*4*	*0*	*59*	*13*	*2*	*0*	*35*	*146*
Glass Hill	752	7	4	4	0	0	2	0	29	199	177	38	2	0	121	170
Variation S2-D1	*109*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*25*	*56*	*0*	*0*	*0*	*0*	*18*	*10*
Variation S2-D2	*98*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*58*	*0*	*14*	*2*	*0*	*19*	*5*
Mill Creek	784	5	0	0	0	2	5	0	30	168	159	42	7	0	106	261

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Variation S2-A1

Variation S2-A1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest and Native Grassland vegetation communities. Moderate residual impacts also are expected where Variation S2-A1 crosses Mountain Shrub, Tall Sagebrush Steppe, and RCA vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-A2

Variation S2-A2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest and Native Grassland vegetation communities. Moderate residual impacts also are expected where Variation S2-A2 crosses Mountain Shrub, Tall Sagebrush Steppe, and RCA vegetation communities. Variation S2-A2 would disturb greater amounts of RCA vegetation communities than Variation S2-A1. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-B1

Variation S2-B1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest, Mountain Shrub, and RCA vegetation communities. Moderate residual impacts also are expected where Variation S2-B1 crosses Juniper and Mahogany Woodland vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-B2

Variation S2-B2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest, Mountain Shrub, and RCA vegetation communities. Moderate residual impacts also are expected where Variation S2-B2 crosses Tall Sagebrush Steppe vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-C1

Variation S2-C1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest, Juniper and Mahogany Woodland, and Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S2-C1 crosses Mountain Shrub and RCA vegetation communities. Direct and indirect effects on vegetation

communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-C2

Variation S2-C2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest, Juniper and Mahogany Woodland, and Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S2-C2 crosses Mountain Shrub, Dwarf Sagebrush, and RCA vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-E1

Variation S2-E1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest and Mountain Shrub vegetation communities. Moderate residual impacts also are expected where Variation S2-E1 crosses RCA and Tall Sagebrush Steppe vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-E2

Variation S2-E2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest, Juniper and Mahogany Woodland, and Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S2-E2 crosses Mountain Shrub and RCA vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-F1

Variation S2-F1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mountain Shrub and Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S2-F1 crosses Dwarf Sagebrush, Native Grassland, Juniper and Mahogany Woodlands, and RCA vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-F2

Variation S2-F2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mountain Shrub and Tall Sagebrush Steppe vegetation communities. Moderate residual

impacts also are expected where Variation S2-F2 crosses Dwarf Sagebrush, Native Grassland, Juniper and Mahogany Woodlands, and RCA vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Glass Hill Alternative

The Glass Hill Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe, Mountain Shrub, and Mixed Conifer Forest vegetation communities. Moderate impacts also are anticipated where the alternative route crosses RCAs, Aspen, Dwarf Sagebrush Steppe, Juniper and Mahogany Woodlands, and Native Grasslands. Low residual impacts on vegetation communities are expected where the Glass Hill Alternative crosses Agriculture, Bare Ground, Cliffs, Talus, and Non-native Grassland communities. Direct and indirect effects on vegetation communities and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-D1

Variation S2-D1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest and RCA vegetation communities. Moderate residual impacts also are expected where Variation S2-D1 crosses Tall Sagebrush Steppe vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S2-D2

Variation S2-D2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Mixed Conifer Forest and RCA vegetation communities. Moderate residual impacts also are expected where Variation S2-D2 crosses Tall Sagebrush Steppe vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Mill Creek Alternative

The Mill Creek Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe, Mountain Shrub, and Mixed Conifer Forest vegetation communities. Moderate impacts also are anticipated where the alternative route crosses RCA, Dwarf Sagebrush Steppe, Juniper and Mahogany Woodlands, and Native Grasslands. Low residual impacts on vegetation communities are expected where the Mill Creek Alternative crosses Agriculture, Bare Ground, Cliffs, Talus, and Non-native Grassland communities. Direct and indirect effects on vegetation communities and the application of design features and

selective mitigation measures to reduce the anticipated levels of impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Plant Species

Table 3-124 identifies the federally listed or candidate plant species known to occur in the 10-mile analysis corridor for all alternatives considered in Segment 2. All known occurrences of federally listed and candidate plant species exist only on privately owned land, and none exist in the 1-mile analysis corridor of any alternative considered in Segment 2.

Table 3-124. Federally Listed Plant Occurrences in the 10-mile Analysis Corridor for Segment 2—Blue Mountains

Alternative Route	Howell's Spectacular Thelypody
Applicant's Proposed Action	9
Variation S2-A1	*0*
Variation S2-A2	*0*
Variation S2-B1	*0*
Variation S2-B2	*0*
Variation S2-C1	*0*
Variation S2-C2	*0*
Variation S2-E1	*0*
Variation S2-E2	*0*
Variation S2-F1	*9*
Variation S2-F2	*9*
Glass Hill	9
Variation S2-D1	*0*
Variation S2-D2	*0*
Mill Creek	9

Applicant's Proposed Action Alternative

Nine occurrences of Howell's spectacular thelypody are known to exist south of the alternative route with the nearest occurrence at Clover Creek being approximately 1.4 miles from the centerline of the Applicant's Proposed Action Alternative. None of these occurrences exist in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative. All nine Howell's spectacular thelypody occurrences exist on privately owned lands, however one occurrence south of North Powder, Oregon is located on land protected by a conservation easement with USFWS for protection and enhancement of plant and animal habitat and populations (USFWS 2010). With the exception of the conservation easement protected occurrence, none of these nine occurrences have been surveyed since 1998, and the USFWS considers the species possibly extirpated from two occurrences near North Powder (USFWS 2010).

All known occurrences of Howell's spectacular thelypody exist outside the 1-mile analysis corridor and are unlikely to be affected by implementation of the Applicant's Proposed Action Alternative. Vegetation clearing and soil disturbance in areas contributing to watersheds occupied by Howell's spectacular

thelypody could result in alteration to runoff patterns, hydrologic regimes, or introduction of invasive plants. These effects are described in greater detail in Section 3.2.3.6. High levels of residual impacts are anticipated if B2H Project activities result in the mortality of individuals or adverse modification of occupied habitat, and low levels of residual impacts are anticipated if temporary disturbance to federally listed or candidate plant species occurs (Table 3-94). If occurrences of Howell's spectacular thelypody have been extirpated, any impacts on extant occurrences resulting from implementation of the Applicant's Proposed Action Alternative would have greater effects on long-term sustainability of the species. However, given the distance between the Applicant's Proposed Action Alternative and the nearest occurrence at Clover Creek, any disturbance implementation of the Applicants Proposed Action Alternative to Howell's spectacular thelypody or occupied habitat will likely be limited in intensity and unlikely to result in mortality of individuals or adverse modification disturbance to occupied habitat. Low impacts resulting from short-term disturbance, such as dust deposition or minor, temporary alteration to runoff patterns in occupied habitat, could potentially occur in known occurrences. These potential low impacts on known occurrences are unlikely to affect the long-term sustainability of Howell's spectacular thelypody. If occurrences of Howell's spectacular thelypody have been extirpated, any impacts on extant occurrences resulting from implementation of the Applicant's Proposed Action Alternative could have greater effects on long-term sustainability of the species. However, given the expected intensity of disturbance to known occurrences and the presence of two large, protected occurrences near Haines and North Powder, implementation of the Applicant's Proposed Action Alternative would be unlikely to affect the long-term sustainability of Howell's spectacular thelypody. Complete clearance surveys for Howell's spectacular thelypody have not been conducted for the Applicant's Proposed Action Alternative or other alternative routes considered in Segment 2. If new Howell's spectacular thelypody occurrences or other federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, and disturbance resulting from B2H Project activities is in or adjacent to habitat, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion, reduction and isolation of patch size, or alteration of runoff patterns. These effects are described in greater detail in Section 3.2.3.6. High levels of residual impacts are anticipated if B2H Project activities result in the mortality of individuals or adverse modification of occupied habitat, and low levels of residual impacts are anticipated if temporary disturbance to federally listed or candidate plant species occurs.

However, impacts on federally listed species are anticipated to be largely avoided through application of design features of the B2H Project for environmental protection and selective mitigation measures. Design Feature 4 requires that preconstruction surveys be conducted for federally listed species. In areas determined to be occupied by federally listed species, Selective Mitigation Measures 8 and 13 would be applied to span, avoid, or reduce disturbance in federally listed plant species habitat. In addition, design features of the B2H Project for environmental protection aimed to reduce the amounts of disturbance and prevent the establishment of invasive plants would limit impacts on federally listed species. Additional measures to limit adverse modification of federally listed plant habitat and effects on individuals developed through the Section 7 consultation process could include species specific avoidance buffers, herbicide application restrictions, and multi-year surveys.

The extent of impacts on federally listed or candidate plant species would depend on the exact location of the B2H Project features in relation to federally listed or candidate plant species and habitats, which would be determined from the results of preconstruction surveys. Given the Applicant's Proposed Action Alternative neither crosses nor contains occurrences in the 1-mile analysis corridor, the potential direct and indirect effects resulting from vegetation clearing, increased risk of invasive plant invasion, and dust deposition are likely to be limited in intensity and the resulting impacts limited in extent.

Variation S2-A1

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-A1. As such, impacts on these resources are not anticipated this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-A2

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-A2. As such, impacts on these resources are not anticipated this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-B1

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-B1. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-B2

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-B2. As such, impacts on these resources are not anticipated this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-C1

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-C1. As such, impacts on these resources are not anticipated this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by

Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-C2

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-C2. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-E1

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-E1. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-E2

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-E2. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-F1

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S2-F1, which contains the same nine occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S2-F2

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S2-F2, which contains the same nine occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Glass Hill Alternative

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of the Glass Hill Alternative, which contains the same nine occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S2-D1

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-D1. As such, impacts on these resources are not anticipated this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S2-D2

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S2-D2. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Mill Creek Alternative

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of the Mill Creek Alternative, which contains the same nine occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Other Sensitive Plant Species

Table 3-125 identifies the sensitive plant species known to occur in the 10-mile analysis corridor for all alternatives considered in Segment 2, and summarizes the occurrences data by land-management jurisdiction and known occurrences in the 10-mile analysis corridor.

Table 3-125. Potentially Affected Sensitive Plant Species for Segment 2—Blue Mountains																
Alternative Route	Total Acres of Disturbance	Salt Heliotrope					Douglas' Clover					Oregon Semaphore Grass				
		Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile			
			Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total
Applicant's Proposed Action	764	1	0	0	0	0	4	0	0	2	2	4	0	0	0	0
Variation S2-A1	*58*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*60*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*85*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B2	*85*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*221*	*1*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*
Variation S2-C2	*191*	*1*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*1*	*1*	*2*	*0*	*0*	*0*	*0*
Variation S2-E1	*52*	*0*	*0*	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*0*
Variation S2-E2	*58*	*0*	*0*	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*0*	*4*	*0*	*0*	*1*	*1*
Variation S2-F1	*260*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*2*	*2*	*4*	*0*	*0*	*0*	*0*
Variation S2-F2	*266*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*0*
Glass Hill	752	1	0	0	0	0	4	0	0	2	2	4	0	0	0	0
Variation S2-D1	*109*	*1*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*98*	*1*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	784	1	0	0	1	1	4	0	0	1	1	4	0	0	1	1

Table Note: Some sensitive plant species occurrences may exist on multiple jurisdictions, and the sum of occurrences on federal, state, and private lands may be greater than the total

Applicant's Proposed Action Alternative

One sensitive plant species is in the 1-mile analysis corridor for the Applicant's Proposed Action Alternative, Douglas' clover (Table 3-125).

If disturbance from B2H Project activities occurs in sensitive plant species habitats, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion or reduction and isolation of patch size. These effects are described in greater detail in Section 3.2.3.6. The criteria used to assess impacts are presented in (Table 3-94). The potential impacts unique to sensitive plant species including population reduction, factors influencing severity of impacts, and the application of design features and selective mitigation measures to reduce impacts on sensitive plant species would be similar to that described for the Applicant's Proposed Action Alternative in Segment 1.

Douglas' clover is a perennial forb considered imperiled by ORBIC (G2S1) due to the few known occurrences limited to a roughly 100 square mile area in central Oregon and ongoing threats from grazing and timber harvesting (ORBIC 2013b). It has been identified as a Type 2 BLM species in Idaho. However, Douglas' clover is known from Washington and Idaho as well. Oregon population trends are

not fully understood, but trends at most occurrences are relatively stable. Numerous occurrences are large, contain over a 1,000 individuals, and several are considered to have excellent viability. ORBIC recognizes 43 occurrences of Douglas' clover in Oregon. However, 81 occurrences were identified during preliminary and other USFS surveys in the region, and no occurrences were identified in Idaho. Of the total 124 known occurrences, two are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. Both of these occurrences exist on privately owned lands where impacts resulting from the B2H Project may be greater. Based on the number of total known occurrences and the broader distribution of the species outside the B2H Project area, implementation of the Applicant's Proposed Action could result in long-term disturbance to Douglas' clover and moderate residual impacts, but is not likely to contribute to the need to list the species under the ESA.

Until the final engineering design and preconstruction surveys completed is available, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative determination of the number of individuals affected, acres of habitat disturbed, or anticipated amount of impacts on sensitive plant species cannot be provided.

Variation S2-A1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-A1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S2-A2

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-A2, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S2-B1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-B1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S2-B2

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-B2, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures

discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S2-C1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-C1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S2-C2

The 1-mile analysis corridor of Variation S2-C2 contains one occurrence of Douglas' clover located on private land adjacent to, and commonly included in studies on, the Rebarrow Research Forest.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S2-C2 could result in long-term disturbance to Douglas' clover and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S2-E1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-E1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S2-E2

The 1-mile analysis corridor of Variation S2-E2 contains one occurrence of Oregon semaphore grass located on private land.

Oregon semaphore grass is a perennial graminoid considered critically imperiled by ORBIC (G1S1) due to the few known occurrences existing mostly on private land and current threats from grazing and alteration to hydrology affecting habitat for this species (ORBIC 2012a). The species is endemic to Oregon and known from only two areas in the state. Population trends are not fully understood and based on limited data, but indicate declining population trends at some occurrences. ORBIC recognizes 9 occurrences, and an additional 3 are known from other BLM surveys in the Oregon. Of the 12 total known occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by implementation of Variation S2-E2. This occurrence exists on privately owned land. However this species is considered threatened by the state of Oregon; and potential impacts resulting from the B2H

Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the compliance with state of Oregon regulations on private lands and the mitigation measures to avoid or reduce disturbance there would be limited impacts on the species. Implementation of Variation S2-E2 could result in long term disturbance to Oregon semaphore grass and moderate residual impacts, but would not likely contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S2-F1

The 1-mile analysis corridor for Variation S2-F1 contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S2-F1 could result in long-term disturbance to Douglas' clover and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S2-F2

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-F2, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Glass Hill Alternative

The 1-mile analysis corridor for the Glass Hill Alternative contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Glass Hill Alternative could result in long-term disturbance to Douglas' clover and moderate residual impacts, but will not contribute to the need to list the species.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's

Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S2-D1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-D1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S2-D2

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S2-D2, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Mill Creek Alternative

The 1-mile analysis corridor for the Mill Creek Alternative contains the greatest number of sensitive species and occurrences of any alternative route considered in Segment 2. It includes salt heliotrope, Douglas' clover and Oregon semaphore grass. Salt heliotrope exists in the 10-mile corridor for all alternative routes, but only is in the 1-mile analysis corridor for the Mill Creek Alternative.

Salt heliotrope is a perennial forb considered imperiled by ORBIC (G5S2) in Oregon due to the limited number of known occurrences in Oregon, however the species is known throughout southern Oregon and broadly distributed across North America (ORBIC 2013a). ORBIC recognizes 37 occurrences of salt heliotrope in Oregon. However, 10 occurrences were identified during other BLM surveys, and no occurrences are known from Idaho. Of the 47 total known occurrences, one is known to occur in the 1-mile analysis corridor and may be affected implementation of the Mill Creek Alternative. The one occurrence exists on private land where impacts resulting from the B2H Project may be greater. Based on the total number of known occurrences and the broad distribution of the species, implementation of the Mill Creek Alternative could result in long-term disturbance to salt heliotrope and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

Similar to the Applicant's Proposed Action Alternative and Variation S2-E2, implementation of the Mill Creek Alternative could result in long-term disturbance and moderate residual impacts on Douglas' clover and Oregon semaphore grass and would not contribute to the need to list the species under the ESA, but may result in high residual impacts on Oregon semaphore grass and contribute to the need to list the species under the ESA..

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's

Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

USFS Sensitive Plant Species

The Applicant's Proposed Action Alternative and all other alternatives cross USFS-administered land and contain USFS sensitive plant species in their respective 10-mile analysis corridors. However, of the six USFS sensitive plant species known to occur in the 10-mile analysis corridor of alternatives and variations crossing USFS-administered lands, only salt heliotrope, scabland penstemon, woolyfruit sedge, and flowery phlox are within 5 miles of where the B2H Project would cross USFS-administered lands near Railroad Canyon. Known occurrences of Douglas' clover and Oregon semaphore grass are more than 10 miles south and east from this location. Scabland penstemon, woolyfruit sedge, and flowery phlox are not are not known to occur in the 1-mile analysis corridor of any alternative or variation crossing USFS-administered lands, and direct or indirect effects resulting from B2H Project-related activities are not expected to affect these known occurrences. Individuals and habitat at the salt heliotrope occurrence located in the 1-mile analysis corridor of the Mill Creek Alternative could be affected by B2H Project-related disturbance.

Unknown occurrences of USFS sensitive plant species may exist on USFS-administered lands crossed by the Applicant's Proposed Action Alternative and all other alternatives. As required by B2H Project Design Feature 4, preconstruction surveys to identify USFS sensitive species and determine habitat extents would be conducted along the right-of-way, as well as any areas requiring ground disturbance (e.g., building or upgrading of access roads, temporary work areas, and multi-use areas) outside the right-of-way.

The types of potential direct and indirect effects, Applicant-committed design features and selective mitigation measures to minimize impacts on USFS sensitive plant species, and extent of impacts on USFS sensitive plant species would be similar to that described for Segment 1. Implementation of the B2H Project may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species for any of the USFS sensitive plant species considered in Segment 2.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes in Segment 2 would result in disturbance to native vegetation communities, which could alter vegetation community structure, soil properties, and water availability creating conditions favorable for noxious weed establishment and spread. Where this disturbance occurs in areas without weed infestations, the B2H Project may introduce noxious weed species through the transport of plant materials. In Segment 2, these areas exist mostly in the Mixed Conifer and Mountain Shrub-dominated vegetation communities located in the Blue Mountains south and west of La Grande, Oregon and are crossed by the Applicant's Proposed Action Alternative and the Glass Hill alternatives. The Mill Creek Alternative avoids crossing the

majority of these areas as it travels along the foothills nearer to La Grande. The extent of noxious weed invasion would be influenced by several factors, including the extent of B2H Project disturbance, preconstruction condition of native vegetation communities, and the distribution of noxious weeds in the surrounding area. The anticipated amounts of B2H Project disturbance to vegetation communities are summarized in Table 3-123. The types of potential effects and impacts on vegetation resources associated with noxious weed invasion, and Applicant-committed design features to reduce noxious weed invasion potential would be similar to that described for Segment 1.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Proposed Actions

The Applicant's Proposed Action Alternative and all other alternative routes would result in disturbance and potential impacts on native vegetation communities (Table 3-123). The types of potential effects and impacts on traditional foods and ethnobotanical resources associated with B2H Project implementation, as well as the application of Applicant-committed design features to reduce disturbance to native vegetation communities and development of site-specific mitigation during government to government consultation would be similar to that described for Segment 1.

Conclusion

The Applicant's Proposed Action Alternative and all other alternative routes considered in Segment 2 would result in predominantly moderate residual impacts on vegetation communities, with all alternatives resulting in similar amounts of impacts. All alternative routes would have similar impacts on traditional foods and other ethnobotanical resources important to tribal groups.

All alternative routes could affect known occurrences of the federally listed Howell's spectacular thelypody, but any impacts are likely to be limited in intensity given the distance between known occurrences and all alternative routes. If new Howell's spectacular thelypody occurrences are identified during preconstruction surveys, application of design features of the B2H Project for environmental protection and selective mitigation measures are expected to avoid individual mortality and adverse modification of occupied habitats. Moderate residual impacts on sensitive plant species could occur for all alternative routes considered.

All alternative routes would result in disturbance to native vegetation communities, increase the potential establishment and spread of noxious weeds and other invasive plants, and cross areas with few identified noxious weed infestations and could introduce noxious weeds and other invasive plants to these areas. The Glass Hill Alternative crosses areas with few identified noxious weed infestations to the greatest extent, and the Applicant's Proposed Action Alternative crosses these areas to the least extent.

The Applicant's Proposed Action Alternative would result in the least impacts on vegetation resources overall compared to the other alternative routes in Segment 2 due to the lower potential of introducing noxious weeds or other invasive plant to undisturbed areas.

SEGMENT 3—BAKER VALLEY

Vegetation Communities

Table 3-126 presents the miles crossed and residual impacts on vegetation communities for all alternative routes and route variations in Segment 3. Table 3-127 presents the anticipated amount of disturbance to vegetation communities in Segment 3. The distribution of vegetation communities in the B2H Project area is displayed on MV-7.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush vegetation communities. Moderate residual impacts also are expected where the Applicant's Proposed Action Alternative crosses RCA, Native Grassland, and Dwarf Sagebrush Steppe vegetation communities. Low residual impacts are expected where the Applicant's Proposed Action Alternative crosses Agriculture and Non-native Grassland communities.

Several wildfires have affected vegetation communities crossed by the Applicant's Proposed Action Alternative, and the current vegetation communities may no longer reflect the vegetation communities identified from the NWGAP data and the assessment of initial and residual impacts. Vegetation communities affected by wildfires can take decades to recover to predisturbance conditions, but are assumed to eventually return to predisturbance conditions, unless weed invasion and fire regime alteration cause native vegetation communities to transition to communities more typical of Non-native Grasslands. The departure from normal of native vegetation communities affected by wildfire is heavily influenced by pre-existing conditions, as well as other factors, including vegetation community type, fire severity, and weather. Vegetation communities with abundant and diverse native plant species, particularly those with high cover of perennial bunchgrasses, are more likely to recruit and resprout with native vegetation similar to predisturbance conditions (Miller et al. 2013). However, without detailed knowledge of the pre-existing conditions across the entirety of the alternative route for each wildfire to predict the departure from normal, the assessment of impacts assumes areas affected by recent wildfires will return to predisturbance conditions. Several design features of the B2H Project for environmental protection aimed to reduce erosion and the extent of disturbance, prevent the introduction and spread of invasive plants, and establish desirable vegetation are anticipated to minimize the risk of recently burned native vegetation communities transitioning to non-native communities as a result of B2H Project activities.

Direct and indirect effects on vegetation communities would include loss of vegetation, alterations to vegetation community structure, and increased risks of invasive plant invasion. The types of potential effects on vegetation communities are described in greater detail in Section 3.2.3.6. Several B2H Project design features are anticipated to limit these effects through reducing the extent of disturbance, preventing the spread and establishment of invasive plants, and reclaiming disturbed areas with desirable native vegetation. Refer to the list of design features applicable to vegetation communities in Section 3.2.3.4.

Table 3-126. Vegetation Resources Inventory Data and Residual Impacts on Segment 3—Baker Valley (miles crossed)																		
Alternative Route	Total Length (miles)	Inventory (Miles Crossed)															Residual Impacts (miles crossed)[1]	
		Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe	Moderate	Low
Applicant's Proposed Action	55.2	0.1	0.0	0.4	0.0	0.2	2.1	0.0	0.0	0.0	0.4	2.6	0.7	0.0	6.3	42.4	53.8	1.4
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.2*	*0.3*	*0.1*	*0.0*	*1.4*	*10.3*	*12.3*	*0.1*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.2*	*0.3*	*0.0*	*0.8*	*10.8*	*11.9*	*0.3*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*1.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.0*	*0.0*	*0.8*	*10.9*	*13.8*	*0.1*
Variation S3-B2	*14.4*	*0.5*	*0.0*	*0.0*	*0.0*	*0.1*	*0.3*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.0*	*0.0*	*1.7*	*11.2*	*13.8*	*0.6*
Variation S3-B3	*14.7*	*0.5*	*0.0*	*0.0*	*0.0*	*0.1*	*0.6*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.2*	*0.0*	*1.6*	*11.1*	*13.9*	*0.8*
Variation S3-B4	*14.3*	*1.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.3*	*0.0*	*0.1*	*0.0*	*0.2*	*0.0*	*1.6*	*9.8*	*12.4*	*1.9*
Variation S3-B5	*14.0*	*1.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.1*	*0.0*	*1.8*	*9.8*	*12.5*	*1.5*
Variation S3-C1	*21.1*	*0.1*	*0.0*	*0.4*	*0.0*	*0.1*	*0.6*	*0.0*	*0.0*	*0.0*	*0.2*	*1.5*	*0.5*	*0.0*	*3.0*	*14.7*	*20.0*	*1.1*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.3*	*0.0*	*0.2*	*0.5*	*0.0*	*0.0*	*0.0*	*0.2*	*1.0*	*1.0*	*0.0*	*3.3*	*15.2*	*20.2*	*1.5*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*	*1.5*	*0.0*	*0.7*	*0.0*	*1.3*	*1.1*	*0.8*	*0.0*	*4.3*	*10.8*	*19.7*	*1.4*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.5*	*0.0*	*0.3*	*1.4*	*0.0*	*0.7*	*0.0*	*1.5*	*1.3*	*0.8*	*0.0*	*3.1*	*11.8*	*19.8*	*1.6*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.1*	*0.7*	*0.0*	*0.4*	*0.9*	*1.5*	*1.1*	*1.8*	*0.0*	*2.8*	*11.1*	*18.5*	*2.5*
Variation S3-C6	*24.7*	*0.0*	*0.5*	*0.5*	*0.0*	*0.1*	*0.4*	*0.0*	*0.9*	*1.5*	*1.4*	*1.9*	*1.0*	*0.0*	*4.7*	*11.8*	*23.1*	*1.6*
Flagstaff A	*55.3*	*1.5*	*0.0*	*0.4*	*0.0*	*0.1*	*1.0*	*0.0*	*0.3*	*0.0*	*0.7*	*1.9*	*0.8*	*0.0*	*7.3*	*41.3*	*52.5*	*2.8*
Timber Canyon	70.3	0.9	0.3	0.2	0.0	0.1	3.9	0.0	0.9	19.4	3.5	2.1	2.2	0.0	12.5	24.3	66.9	3.4
Flagstaff A – Burnt River Mountain	55.3	1.4	0.0	0.3	0.0	0.3	1.9	0.0	1.0	0.0	1.8	1.5	1.1	0.0	8.6	37.4	52.2	3.1

Table 3-126. Vegetation Resources Inventory Data and Residual Impacts on Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Inventory (Miles Crossed)															Residual Impacts (miles crossed)[1]	
		Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe	Moderate	Low
Flagstaff B	56.0	0.6	0.0	0.4	0.0	0.2	1.3	0.0	0.3	0.0	0.7	1.9	0.9	0.0	7.1	42.6	53.9	2.1
Flagstaff B – Burnt River West	55.7	0.5	0.0	0.6	0.0	0.2	1.3	0.0	0.7	0.9	1.9	1.4	2.4	0.0	6.3	39.5	52.0	3.7
Flagstaff B – Durkee	59.6	0.5	0.5	0.5	0.0	0.2	1.1	0.0	1.2	1.5	1.9	2.3	1.4	0.0	8.8	39.7	57.0	2.6

Table Note: [1]High residual impacts on vegetation communities are not anticipated to occur.

Table 3-127. Anticipated Disturbance for Vegetation Resources for Segment 3—Baker Valley (acres)

Alternative Route	Total Disturbance (acres)	Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe
Applicant's Proposed Action	1,238	2	0	9	0	5	47	0	0	0	9	59	16	0	142	954
Variation S3-A1	259	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*4*	*6*	*2*	*0*	*29*	*217*
Variation S3-A2	252	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*4*	*6*	*0*	*16*	*223*
Variation S3-B1	311	*0*	*0*	*0*	*0*	*2*	*31*	*0*	*0*	*0*	*0*	*16*	*0*	*0*	*18*	*244*
Variation S3-B2	315	*11*	*0*	*0*	*0*	*2*	*7*	*0*	*7*	*0*	*7*	*0*	*0*	*0*	*37*	*245*

Table 3-127. Anticipated Disturbance for Vegetation Resources for Segment 3—Baker Valley (acres)																
Alternative Route	**Total Disturbance (acres)**	**Agriculture**	**Aspen**	**Bare Ground, Cliffs, Talus**	**Desert Shrub**	**Developed/Disturbed**	**Dwarf Sagebrush Steppe**	**Forest- Other**	**Juniper and Mahogany Woodland**	**Mixed Conifer Forest**	**Mountain Shrub**	**Native Grasslands**	**Non-Native Grasslands**	**Open Water**	**Riparian Conservation Area**	**Tall Sagebrush Steppe**
Variation S3-B3	*312*	*11*	*0*	*0*	*0*	*2*	*13*	*0*	*6*	*0*	*6*	*0*	*4*	*0*	*34*	*234*
Variation S3-B4	*300*	*36*	*0*	*0*	*0*	*0*	*13*	*0*	*6*	*0*	*2*	*0*	*4*	*0*	*34*	*207*
Variation S3-B5	*301*	*30*	*0*	*0*	*0*	*0*	*7*	*0*	*7*	*0*	*7*	*0*	*2*	*0*	*39*	*212*
Variation S3-C1	*502*	*2*	*0*	*10*	*0*	*2*	*14*	*0*	*0*	*0*	*5*	*36*	*12*	*0*	*71*	*350*
Variation S3-C2	*512*	*0*	*0*	*7*	*0*	*5*	*12*	*0*	*0*	*0*	*5*	*24*	*24*	*0*	*78*	*359*
Variation S3-C3	*515*	*0*	*0*	*7*	*0*	*7*	*37*	*0*	*17*	*0*	*32*	*27*	*20*	*0*	*105*	*265*
Variation S3-C4	*524*	*0*	*0*	*12*	*0*	*7*	*34*	*0*	*17*	*0*	*37*	*32*	*20*	*0*	*76*	*290*
Variation S3-C5	*576*	*0*	*0*	*16*	*0*	*3*	*19*	*0*	*11*	*25*	*41*	*30*	*49*	*0*	*77*	*304*
Variation S3-C6	*685*	*0*	*14*	*14*	*0*	*3*	*11*	*0*	*25*	*42*	*39*	*53*	*28*	*0*	*130*	*327*
Flagstaff A	1,228	33	0	9	0	2	22	0	7	0	16	42	18	0	163	922
Timber Canyon	1,691	22	7	5	0	2	94	0	22	467	84	51	53	0	301	585
Flagstaff A – Burnt River Mountain	1,241	31	0	7	0	7	42	0	22	0	40	33	24	0	192	833
Flagstaff B	1,239	13	0	9	0	4	29	0	7	0	16	42	20	0	157	944
Flagstaff B – Burnt River West	1,305	12	0	14	0	5	30	0	16	21	45	33	56	0	148	925
Flagstaff B – Durkee	1,422	12	12	12	0	5	26	0	29	36	45	55	33	0	210	947
NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.																

Where the Applicant's Proposed Action Alternative crosses RCAs, disturbance to these vegetation communities is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible, as described by B2H Project Design Features 15 and 16. Where spanning would not be feasible, the application of several selective mitigation measures aimed to reduce the creation of new access roads, soil disturbance, and vegetation removal in the right-of-way are expected to reduce impacts from a high initial level to a moderate residual level. Reducing vegetation removal in the right-of-way (Selective Mitigation Measure 5) also would be applied to Mixed Conifer Forest, Aspen, and Juniper and Mahogany Woodlands, but is not anticipated to reduce residual impacts. Table 3-95 summarizes the expected level of initial impacts, selective mitigation measures that would be applied, and resulting residual impacts on vegetation communities.

Variation S3-A1

Variation S3-A1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S3-A1 crosses RCA vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-A2

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S3-A2 would be similar to Variation S3-A1. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-B1

Variation S3-B1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S3-B1 crosses Dwarf Sagebrush, Native Grassland, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-B2

Variation S3-B2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S3-B2 crosses Dwarf Sagebrush, Juniper and Mahogany Woodland, Mountain Shrub, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation

measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-B3

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S3-B3 would be similar to Variation S3-B2. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-B4

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S3-B4 would be similar to Variation S3-B2. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-B5

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S3-B5 would be similar to Variation S3-B2. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-C1

Variation S3-C1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S3-C1 crosses Dwarf Sagebrush Steppe, Native Grassland, and RCA vegetation communities. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-C2

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S3-C2 would be similar to Variation S3-C1. Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-C3

Variation S3-C3 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected

where Variation S3-C3 crosses Mountain Shrub, Dwarf Sagebrush Steppe, Native Grasslands, Juniper and Mahogany Woodlands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-C4

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S3-C4 would be similar to Variation S3-C3. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-C5

Variation S3-C5 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S3-C5 crosses Dwarf Sagebrush Steppe, Mixed Conifer Forest, Mountain Shrub, Native Grasslands, Juniper and Mahogany Woodlands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S3-C6

Variation S3-C6 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S3-C6 crosses Aspen, Dwarf Sagebrush Steppe, Mixed Conifer Forest, Mountain Shrub, Native Grasslands, Juniper and Mahogany Woodlands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Flagstaff A Alternative

The Flagstaff A Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where the Flagstaff A Alternative crosses Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mountain Shrub, Native Grasslands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of

residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The Timber Canyon Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe and Mixed Conifer Forest vegetation communities. Moderate residual impacts also are expected where the Timber Canyon Alternative crosses Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mountain Shrub, Native Grasslands, and RCA vegetation communities. The Timber Canyon Alternative is approximately 10 to 15 miles longer than any alternative route considered in Segment 3 and would result in greater amounts of total disturbance and disturbance to RCA and Mixed Conifer Forest vegetation communities than any alternative route considered in Segment 3 (Table 3-127). Direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where the Flagstaff A – Burnt River Mountain Alternative crosses Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mountain Shrub, Native Grasslands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where the Flagstaff B Alternative crosses Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mountain Shrub, Native Grasslands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where the Flagstaff B – Burnt River West Alternative crosses Mixed Conifer, Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mountain Shrub, Native Grasslands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct

and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

The Flagstaff B – Durkee Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where the Flagstaff B – Durkee Alternative crosses Aspen, Mixed Conifer, Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mountain Shrub, Native Grasslands, and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Plant Species

Table 3-128 summarizes the extent and distribution of known Howell's spectacular thelypody occurrences in the 10-mile analysis corridor. Howell's spectacular thelypody is not known to occur in the 1-mile analysis corridor for the Applicant's Proposed Action Alternative or any alternative route considered in Segment 3.

Table 3-128. Howell's Spectacular Thelypody Occurrences in the 10-mile Analysis Corridor for Segment 3—Baker Valley

Alternative Route	Number of Occurrences
Applicant's Proposed Action	16
Variation S3-A1	*16*
Variation S3-A2	*16*
Variation S3-B1	*8*
Variation S3-B2	*8*
Variation S3-B3	*8*
Variation S3-B4	*8*
Variation S3-B5	*8*
Variation S3-C1	*0*
Variation S3-C2	*0*
Variation S3-C3	*0*
Variation S3-C4	*0*
Variation S3-C5	*0*
Variation S3-C6	*0*
Flagstaff A	16
Timber Canyon	8
Flagstaff A – Burnt River Mountain	16
Flagstaff B	16
Flagstaff B – Burnt River West	16
Flagstaff B – Durkee	16

Applicant's Proposed Action Alternative

Sixteen occurrences of Howell's spectacular thelypody are known to exist west of the Applicant's Proposed Action Alternative with the nearest occurrence at Baldock Slough being approximately 1.9 miles from the centerline of the alternative route. None of these occurrences exist in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative. All 16 Howell's spectacular thelypody occurrences exist on privately owned lands, however one occurrence south of North Powder, Oregon is located on land protected by a conservation easement with USFWS for protection and enhancement of plant and animal habitat and populations (USFWS 2010) and the seven occurrences near the Baldock Slough are located on land held in a Wetland Reserve Program easement. Only the conservation easement protected occurrence and the seven occurrences in the Baldock Slough introduction site have been recently surveyed. Occurrences in the Baldock Slough introduction site were found to have few plants and declining population trends at some occurrences (Currin et al. 2010). With the exception of the conservation easement protected occurrence and the occurrences in the Baldock Slough introduction site, none of these nine occurrences have been surveyed since 1998, and the USFWS considers the species possibly extirpated from two occurrences near North Powder (USFWS 2010).

All known occurrences of Howell's spectacular thelypody exist outside the 1-mile analysis corridor and are unlikely to be affected by implementation of the Applicant's Proposed Action Alternative. Vegetation clearing and soil disturbance in areas contributing to watersheds occupied by Howell's spectacular thelypody could result in alteration to runoff patterns, hydrologic regimes, or introduction of invasive plants. These effects are described in greater detail in Section 3.2.3.6. High levels of residual impacts are anticipated if B2H Project activities result in the mortality of individuals or adverse modification of occupied habitat, and low levels of residual impacts are anticipated if temporary disturbance to federally listed or candidate plant species occurs (Table 3-94). If occurrences of Howell's spectacular thelypody have been extirpated, any impacts on extant occurrences resulting from implementation of the Applicant's Proposed Action Alternative would have greater effects on long-term sustainability of the species. However, given the distance between the Applicant's Proposed Action Alternative and the nearest occurrence at the Baldock Slough, any disturbance from vegetation clearing or soil disturbance to Howell's spectacular thelypody or occupied habitat will likely be limited in intensity and unlikely to result in mortality of individuals or adverse modification disturbance to occupied habitat. Low impacts resulting from short-term disturbance, such as dust deposition or minor, temporary alteration to runoff patterns in occupied habitat, could potentially occur in known occurrences. These potential low impacts on known occurrences are unlikely to affect the long-term sustainability of Howell's spectacular thelypody. If occurrences of Howell's spectacular thelypody have been extirpated from occurrences, any impacts on extant occurrences resulting from implementation of the Applicant's Proposed Action Alternative could have greater effects on long-term sustainability of the species. However, given the expected intensity of disturbance to known occurrences and the presence of two large, protected occurrences near Haines and North Powder, implementation of the Applicant's Proposed Action Alternative would be unlikely to affect the long-term sustainability of Howell's spectacular thelypody.

Complete clearance surveys for Howell's spectacular thelypody have not been conducted for the Applicant's Proposed Action Alternative or other alternative routes considered in Segment 3. If new

Howell's spectacular thelypody occurrences or other federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, and disturbance resulting from B2H Project activities is in or adjacent to habitat, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion, reduction and isolation of patch size, and alteration of runoff patterns. These effects are described in greater detail in Section 3.2.3.6. High levels of residual impacts are anticipated if B2H Project activities result in the mortality of individuals or adverse modification of occupied habitat, and low levels of residual impacts are anticipated if temporary disturbance, such as dust deposition or decreased pollinator attractiveness, to federally listed or candidate plant species occurs (Table 3-94).).

However, impacts on federally listed species are anticipated to be largely avoided through application of design features of the B2H Project for environmental protection and selective mitigation measures. Design Feature 4 requires that preconstruction surveys be conducted for federally listed species. In areas determined to be occupied by federally listed species, Selective Mitigation Measures 8 and 13 would be applied to span, avoid, or reduce disturbance in federally listed plant species habitat. In addition, design features of the B2H Project for environmental protection aimed to reduce the amounts of disturbance and prevent the establishment of invasive plants would limit impacts on federally listed species. Additional measures to limit adverse modification of federally listed plant habitat and effects on individuals developed through the Section 7 consultation process could include species specific avoidance buffers, herbicide application restrictions, and multi-year surveys.

The extent of impacts on federally listed or candidate plant species would depend on the exact location of the B2H Project features in relation to federally listed or candidate plant species and habitats, which would be determined from the results of preconstruction surveys. Given the Applicant's Proposed Action Alternative neither crosses nor contains occurrences in the 1-mile analysis corridor, the potential direct and indirect effects resulting from vegetation clearing, increased risk of invasive plant invasion, and dust deposition are likely to be limited in intensity and the resulting impacts limited in extent.

Variation S3-A1

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-A1, which contains the same 16 occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S3-A2

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-A2, which contains the same 16 occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S3-B1

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-B1, which contains the eight Howell's spectacular thelypody occurrences in the Baldock Slough introduction site and North Baker populations. These eight occurrences also are contained in the 10-mile analysis corridor of the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S3-B2

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-B2, which contains the eight Howell's spectacular thelypody occurrences in the Baldock Slough introduction site and North Baker populations. These eight occurrences also are contained in the 10-mile analysis corridor of the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S3-B3

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-B3, which contains the eight Howell's spectacular thelypody occurrences in the Baldock Slough introduction site and North Baker populations. These eight occurrences also are contained in the 10-mile analysis corridor of the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S3-B4

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-B4, which contains the eight Howell's spectacular thelypody occurrences in the Baldock Slough introduction site and North Baker populations. These eight occurrences also are contained in the 10-mile analysis corridor of the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S3-B5

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-B5, which contains the eight Howell's spectacular thelypody occurrences in the Baldock Slough introduction site and North Baker populations. These eight occurrences also are contained in the 10-mile analysis corridor of the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual

impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Variation S3-C1

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S3-C1. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S3-C2

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S3-C2. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S3-C3

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S3-C3. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S3-C4

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S3-C4. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S3-C5

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S3-C5. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Variation S3-C6

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor of Variation S3-C6. As such, impacts on these resources are not anticipated for this variation. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species.

Flagstaff A Alternative

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of the Flagstaff A Alternative, which contains the same 16 occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of Variation S3-B5, which contains the eight Howell's spectacular thelypody occurrences in the North Powder population. These eight occurrences also are contained in the 10-mile analysis corridor of the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of the Flagstaff A – Burnt River Mountain Alternative, which contains the same 16 occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of the Flagstaff B Alternative, which contains the same 16 occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of the Flagstaff B – Burnt River West Alternative, which contains the same 16 occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and

extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

Federally listed or candidate plant species are known to occur in the 10-mile analysis corridor of the Flagstaff B – Durkee Alternative, which contains the same 16 occurrences of Howell's spectacular thelypody as the Applicant's Proposed Action Alternative. The types of potential effects, application of mitigation measures based on preconstruction surveys, anticipated residual impacts, and extent of impacts on federally listed plant species would be similar to the Applicant's Proposed Action Alternative.

Other Sensitive Plant Species

Table 3-129 identifies the sensitive plant species known to occur in the 10-mile analysis corridor for all alternatives considered in Segment 3, and summarizes the occurrence data by land-management jurisdiction and known occurrences in the 10-mile analysis corridor.

Applicant's Proposed Action Alternative

Several sensitive plant species are known to exist in the 1-mile analysis corridor for the Applicant's Proposed Action Alternative. These species include white wooly buckwheat, Snake River goldenweed, and Oregon princesplume. The number of known occurrences in the 1-mile and 10-mile analysis corridors, as well as the jurisdiction of those occurrences is presented in Table 3-129.

If disturbance from B2H Project activities occurs in sensitive plant species habitats, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion or reduction and isolation of patch size. These effects are described in greater detail in Section 3.2.3.6. The criteria used to assess impacts are presented in Table 3-94. The potential impacts unique to sensitive plant species including population reduction, factors influencing severity of impacts, and the application of design features and selective mitigation measures to reduce impacts on sensitive plant species would be similar to that described for the Applicant's Proposed Action Alternative in Segment 1.

White wooly buckwheat is a perennial forb considered rare, uncommon, or threatened by ORBIC (G4G4T3S3) based on the few known occurrences limited to southeastern Oregon. It has been identified as a Type 3 BLM species in Idaho. Population trends or species specific threats are unknown, but due to the small number of known occurrences would be sensitive to disturbances (ORBIC 2012c). ORBIC recognizes 16 occurrences of white wooly buckwheat in Oregon. However, 17 white wooly buckwheat occurrences were identified during preliminary and other BLM surveys in the region, and at least 2 occurrences are known from Idaho. Of the total 35 known white wooly buckwheat occurrences, eight are known to occur in the 1-mile analysis corridor and may be affected by implementation of the B2H Project. Of these eight occurrences, six exist on privately owned lands where impacts resulting from the B2H Project may be greater.

Based the number of total known occurrences, and the existence of several occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative is not likely to result in high levels of impact on white wooly buckwheat or contribute to the need to list the species under the ESA. High levels of impacts on white wooly buckwheat are not likely, but could occur given the possibility of severe disturbance to multiple occurrences on private land, the limited distribution of the species, and lack of knowledge regarding population trends. If implementation of the Applicant's Proposed Action Alternative results in severe disturbance to multiple occurrences on private lands, high residual impacts could occur and contribute to the need to list the species under the ESA.

Snake River goldenweed is a perennial forb also considered rare, uncommon, or threatened by ORBIC (G3S3) for similar reasons as white wooly buckwheat (ORBIC 2010a). It has been identified as a Type 3 BLM species in Idaho. Population trends have been assessed for this species, and indicate declining trends at many occurrences. However, numerous occurrences are estimated to have more than 500 individuals and are considered to have substantial ecological integrity and resistance to minor disturbance (ORBIC 2010a). ORBIC recognizes 42 occurrences of Snake River goldenweed in Oregon. However, preliminary and other BLM surveys in the region identified 233 occurrences, and at least 33 other occurrences of Snake River goldenweed are known from Idaho. Of the total 308 occurrences, 20 are known to occur in the 1-mile analysis corridor and may be affected by implementation of the B2H Project. Of these 20 occurrences, 17 exist on privately owned land where impacts resulting from the B2H Project may be greater. However this species is considered endangered by the state of Oregon; and potential impacts resulting from the B2H Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the total number of occurrences, compliance with state of Oregon regulations on private lands, and the mitigation measures to avoid or reduce disturbance there would be limited impacts on the species. Implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

Table 3-129. Potentially Affected Sensitive Plant Species for Segment 3—Baker Valley

Alternative Route	Total Acres of Disturbance	Mingan Moonwort					Cordilleran Sedge					Retrorse Sedge					Hairy Wild Cabbage					White Wooly Buckwheat					Salt Heliotrope					Snake River Goldenweed					Oregon Princesplume				
		Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile			
			Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total
Applicant's Proposed Action	1,238	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	9	4	0	6	8	1	0	0	0	0	68	8	0	17	20	5	1	0	5	5
Variation S3-A1	*259*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*252*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*311*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*315*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B3	*312*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B4	*300*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B5	*301*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C1	*502*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*9*	*4*	*0*	*6*	*8*	*0*	*0*	*0*	*0*	*0*	*68*	*8*	*0*	*17*	*20*	*5*	*1*	*0*	*5*	*5*
Variation S3-C2	*512*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*1*	*0*	*0*	*1*	*9*	*4*	*0*	*6*	*8*	*0*	*0*	*0*	*0*	*0*	*68*	*8*	*0*	*17*	*20*	*5*	*1*	*0*	*5*	*5*
Variation S3-C3	*515*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*68*	*7*	*0*	*18*	*20*	*5*	*0*	*0*	*0*	*0*
Variation S3-C4	*524*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*68*	*7*	*0*	*18*	*20*	*5*	*0*	*0*	*0*	*0*
Variation S3-C5	*576*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*5*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*60*	*1*	*0*	*7*	*7*	*2*	*0*	*0*	*0*	*0*
Variation S3-C6	*685*	*0*	*0*	*0*	*0*	*0*	*10*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*61*	*11*	*0*	*11*	*18*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	1,228	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	9	4	0	8	8	1	0	0	0	0	68	8	0	17	20	5	1	0	5	5
Timber Canyon	1,691	6	1	0	0	1	27	4	0	0	4	1	2	0	1	1	0	0	0	0	0	8	0	0	3	3	0	0	0	0	0	69	8	0	17	20	5	0	0	2	2
Flagstaff A – Burnt River Mountain	1,241	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	9	0	0	0	0	1	0	0	0	0	68	7	0	18	20	5	0	0	0	0
Flagstaff B	1,239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	9	4	0	6	8	1	0	0	0	0	68	8	0	17	20	5	1	0	5	5
Flagstaff B – Burnt River West	1,305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	5	0	0	0	0	1	0	0	0	0	60	1	0	7	7	2	0	0	0	0
Flagstaff B – Durkee	1,422	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	0	1	0	0	0	0	61	11	0	10	18	0	0	0	0	0

Table Note: Some sensitive plant species occurrences may exist on multiple jurisdictions, and the sum of occurrences on federal, state, and private lands may be greater than the total

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Oregon princesplume is a biennial forb considered imperiled by ORBIC (G2S2) due the limited number of known occurrences restricted to southeastern Oregon and western Idaho, of which few have stable population trends. It has been identified as a Type 2 BLM species in Idaho. Ongoing threats to the species include grazing, disturbance associated with mining and OHV traffic, and habitat conversion to annual grasslands (ORBIC 2012b). Population trends at several smaller occurrences have been noted as declining, but multiple occurrences appear to have excellent viability despite ongoing threats. ORBIC recognizes 63 occurrences of Oregon princesplume in Oregon. However, 118 occurrences were identified during preliminary and other BLM surveys in the regions, and at least 5 occurrences are known from Idaho. Of the 186 total known occurrences, five are known to occur in the 1-mile analysis corridor and may be affected by implementation of the B2H Project. Of these five occurrences, all exist on privately owned land where impacts resulting from the B2H Project may be greater. Based the number of total known occurrences, and apparent species resistance to ongoing threats, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance to Oregon princesplume and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

Until the final engineering design and preconstruction surveys completed is available, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative determination of the number of individuals affected, acres of habitat disturbed, or anticipated amount of impacts on sensitive plant species cannot be provided.

Variation S3-A1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S3-A1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S3-A2

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S3-A2, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S3-B1

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S3-B1, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S3-B2

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S3-B2, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S3-B3

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S3-B3, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S3-B4

Only one occurrence of salt heliotrope on private land is known in the 1-mile analysis corridor of Variation S3-B4 (Table 3-129).

Salt heliotrope is a perennial forb considered imperiled by ORBIC (G5S2) in Oregon due to the limited number of known occurrences in Oregon, however the species is known throughout southern Oregon and broadly distributed across North America (ORBIC 2013a). ORBIC recognizes 37 occurrences of salt heliotrope in Oregon. However, 10 occurrences were identified during other BLM surveys, and no occurrences are known from Idaho. Of the 47 total known occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by the B2H Project. The one occurrence in the 1-mile analysis corridor of Variation S3-B4 exists on private land where impacts resulting from the B2H Project may be greater. Based on the total number of known occurrences and the broad distribution of the species, implementation of Variation S3-B4 could result in long-term disturbance to salt heliotrope and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S3-B5

There are no known occurrences of sensitive plant species in the 1-mile analysis corridor of Variation S3-B5, and as such, impacts on sensitive plant species are not anticipated. If sensitive plant species are found during preconstruction surveys, the same design features and selective mitigation measures discussed for the Applicant's Proposed Action Alternative would limit impacts on sensitive plant species.

Variation S3-C1

The 1-mile analysis corridor for Variation S3-C1 contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S3-C1 could result in long-term disturbance and moderate residual impacts on Oregon princesplume or Snake River goldenweed but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on white wooly buckwheat and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S3-C2

The 1-mile analysis corridor for Variation S3-C2 contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative, but also includes one occurrence of hairy wild cabbage.

Hairy wild cabbage is biennial forb species considered imperiled by ORBIC (G4S2) due the limited number of known occurrences limited to southeastern Oregon; however, the species is known throughout the Great Basin region (ORBIC 2013a). Population trends or species specific threats are unknown in Oregon, but most known occurrences contain few individuals and are likely sensitive to disturbance. ORBIC recognizes 3 occurrences in Oregon. However, other BLM surveys in the region identified 7 occurrences and no occurrences are known from Idaho. Of the 10 known occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by the B2H Project. The known occurrence of hairy wild cabbage exists on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based the broader distribution of the species beyond the B2H Project area, and the existence of the occurrence on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of Variation S3-C2 could result in long-term disturbance to hairy wild cabbage and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. Similar to the Applicant's Proposed Action Alternative, implementation of Variation S3-C2 could result in long-term disturbance and moderate residual impacts on Oregon princesplume or Snake River goldenweed but would not contribute to the need to list these species

under the ESA, but may result in high residual impacts on white wooly buckwheat and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures, and anticipated residual impacts would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S3-C3

The 1-mile analysis corridor for Variation S3-C3 contains occurrences of Snake River goldenweed. Some of these occurrences are different than those contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, but the total number of occurrences is the same.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S3-C3 could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S3-C4

The 1-mile analysis corridor for Variation S3-C4 contains occurrences of Snake River goldenweed. Some of these occurrences are different than those contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, but the total number of occurrences is the same.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S3-C4 could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S3-C5

The 1-mile analysis corridor for Variation S3-C5 contains occurrences of Snake River goldenweed. The seven occurrences contained in the 1-mile analysis corridor for Variation S3-C5 also are contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S3- could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S3-C6

The 1-mile analysis corridor for Variation S3-C6 contains occurrences of Snake River goldenweed. Some of these occurrences are different than those contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, but the total number of occurrences is less.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S3-C6 could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Flagstaff A Alternative

The 1-mile analysis corridor for the Flagstaff A Alternative contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Flagstaff A Alternative could result in long-term disturbance and moderate residual impacts on Oregon princesplume or Snake River goldenweed but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on white wooly buckwheat and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Timber Canyon Alternative

The 1-mile analysis corridor of the Timber Canyon Alternative contains the greatest number of sensitive plant species, including mingan moonwort, cordilleran sedge, and retrorse sedge in addition to the

white wooly buckwheat, Snake River goldenweed, and Oregon princesplume also contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative.

Mingan moonwort a perennial forb that is considered rare, uncommon or threatened by ORBIC (G4G5S3) based on the few known occurrences in Oregon (ORBIC 2013a). Population trends and species specific threats are unknown, but known occurrences are generally composed of fewer than 100 individuals and are likely sensitive to disturbance. However, research suggests that mingan moonwort is associated with intermittent disturbance which maintains light, nutrient, and mycorrhizal availabilities (Ahlenslager and Potash 2007). Occurrences of mingan moonwort are known throughout Oregon and northern North America. ORBIC recognizes 120 occurrences of mingan moonwort in Oregon. However, 194 occurrences were identified during other USFS or BLM surveys, and no occurrences are known from Idaho. Of the total 314 occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by implementation of the B2H Project. This occurrence exists on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the number of total known occurrences, the broader distribution of the species beyond the B2H Project area, and the existence of the occurrence on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Timber Canyon Alternative could result in long-term disturbance to mingan moonwort and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

Cordilleran sedge is a perennial graminoid considered imperiled by ORBIC (G3G4S2) based on the limited number of known occurrences in Oregon and ongoing threats, including grazing and fire suppression (Carex Working Group 2008; ORBIC 2013a). Population trends are unknown. Cordilleran sedge is known from occurrences throughout high-elevation areas in Oregon, as well as western North America. ORBIC recognizes 80 occurrences of cordilleran sedge. However, 133 occurrences were identified during other USFS or BLM surveys, and no occurrences are known from Idaho. Of the total 213 known occurrences, four are known to occur in the 1-mile analysis corridor and may be affected by implementation of the B2H Project. These occurrences exist on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the number of total known occurrences, the broader distribution of the species beyond the B2H Project area, and the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Timber Canyon Alternative could result in long-term disturbance to cordilleran sedge and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

Retrorse sedge is a perennial graminoid considered critically imperiled due to the limited number of occurrences in Oregon (ORBIC 2013a). Population trends are unknown in Oregon. Retrorse sedge is known from only a few locations in Oregon with only two located east of the Cascades, but broadly distributed across northern North America. ORBIC recognizes nine occurrences of retrorse sedge.

However, one other occurrence was identified during other USFS surveys and none known from Idaho. Of the 10 total occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by implementation of the B2H Project. This occurrence exists on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the broader distribution of the species beyond the B2H Project area, and the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Timber Canyon Alternative could result in long-term disturbance to retrorse sedge and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

Similar to the Applicant's Proposed Action Alternative, implementation of the Timber Canyon Alternative could result in long-term disturbance and moderate residual impacts on Oregon princesplume or Snake River goldenweed but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on white wooly buckwheat and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Flagstaff A – Burnt River Mountain Alternative

The 1-mile analysis corridor of the Flagstaff A – Burnt River Mountain Alternative contains occurrences of Snake River goldenweed. Some of these occurrences are different than those contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, but the total number of occurrences is the same.

Similar to the Applicant's Proposed Action Alternative, implementation of the Flagstaff A – Burnt River Mountain Alternative could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Flagstaff B Alternative

The 1-mile analysis corridor for the Flagstaff B Alternative contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Flagstaff B Alternative could result in long-term disturbance and moderate residual impacts on Oregon princesplume or Snake River goldenweed but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on white wooly buckwheat and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Flagstaff B – Burnt River West Alternative

The 1-mile analysis corridor the Flagstaff B – Burnt River West Alternative contains seven occurrences of Snake River goldenweed. The seven occurrences contained in the 1-mile analysis corridor for the Flagstaff B – Burnt River West Alternative also are contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of the Flagstaff B – Burnt River West Alternative could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Flagstaff B – Durkee

The 1-mile analysis corridor for the Flagstaff B – Durkee alternative contains occurrences of Snake River goldenweed. Some of these occurrences are different than those contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, but the total number of occurrences is less.

Similar to the Applicant's Proposed Action Alternative, implementation of the Flagstaff B – Durkee Alternative could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

U.S. Forest Service Sensitive Plant Species

The Timber Canyon Alternative crosses USFS-administered land and contains several known occurrences of USFS sensitive plant species in the 10-mile and 1-mile analysis corridors, all of which are located on USFS-administered land. Unknown occurrences of USFS sensitive plant species may exist on USFS-administered lands crossed by the Timber Canyon Alternative. As required by B2H Project Design Feature 4, preconstruction surveys to identify USFS sensitive species and determine habitat extents would be conducted along the right-of-way, as well as any areas requiring ground disturbance (e.g., building or upgrading of access roads, temporary work areas, and multi-use areas) outside the right-of-way.

The types of potential direct and indirect effects, Applicant-committed design features and selective mitigation measures to minimize impacts on USFS sensitive plant species, and extent of impacts on USFS sensitive plant species would be similar to that described for Segment 1. Implementation of the B2H Project may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species for any of the USFS sensitive plant species considered in Segment 3.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes in Segment 3 would result in disturbance to native vegetation communities, which could alter vegetation community structure, soil properties, and water availability creating conditions favorable for noxious weed establishment and spread. Where this disturbance is in areas without weed infestations, the B2H Project may introduce noxious weed species through the transport of plant materials. In Segment 3, these areas exist mostly in the Mixed Conifer and Mountain Shrub-dominated vegetation communities located along the foothills of the Wallowa Mountains northeast of Baker, Oregon and are crossed only by the Timber Canyon Alternative. The extent of noxious weed invasion would be influenced by several factors, including the extent of B2H Project disturbance, preconstruction condition of native vegetation communities, and the distribution of noxious weeds in the surrounding area. The anticipated amounts of B2H Project disturbance to vegetation communities are summarized in Table 3-127. The types of potential effects and impacts on vegetation resources associated with noxious weed invasion, and Applicant-committed design features to reduce noxious weed invasion potential would be similar to that described for Segment 1.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes would result in disturbance and potential impacts on native vegetation communities (Table 3-127). The types of potential effects and impacts on traditional foods and ethnobotanical resources associated with B2H Project implementation, as well as the application of Applicant-committed design features to reduce

disturbance to native vegetation communities and development of site-specific mitigation during government to government consultation would be similar to that described for Segment 1.

Conclusion

The Applicant's Proposed Action Alternative and all other alternative routes considered in Segment 3 would result in predominantly moderate residual impacts on vegetation communities, with the Timber Canyon Alternative resulting in the greatest moderate residual impacts as it is the longest alternative route considered and would affect Mixed Conifer Forest vegetation communities to a much greater extent. All alternative routes would have similar impacts on traditional foods and other ethnobotanical resources important to tribal groups.

All alternative routes could affect known occurrences of the federally listed Howell's spectacular thelypody, but any impacts are likely to be limited in intensity given the distance between known occurrences and all alternative routes. If new Howell's spectacular thelypody occurrences are identified during preconstruction surveys, application of design features of the B2H Project for environmental protection and selective mitigation measures are expected to avoid individual mortality and adverse modification of occupied habitats. Moderate residual impacts on sensitive species could occur with all alternative routes, and the Applicant's Proposed Action, Flagstaff A, Timber Canyon, and Flagstaff B alternatives, as well as Variations S3-C1 and S3-C2, could result in high residual impacts through disturbance to known white wooly buckwheat occurrences. Based on the available sensitive plant species occurrence data, the Flagstaff B – Burnt River Alternative could affect the fewest sensitive plant occurrences.

All alternative routes would result in disturbance to native vegetation communities and increase the potential establishment and spread of noxious weeds or other invasive plants. The Timber Canyon Alternative crosses areas with few identified noxious weed infestations to the greatest extent of any alternative route considered and could introduce noxious weeds or other invasive plants to these areas.

The Flagstaff B – Burnt River Alternative would result in the least impacts on vegetation resources overall compared to the other alternative routes in Segment 3 due to the low likelihood of high residual impacts on sensitive plant species and the possibility of affecting the fewest sensitive plant occurrences.

SEGMENT 4—BROGAN

Vegetation Communities

Table 3-130 presents the residual impacts on vegetation communities for all alternative routes and route variations in Segment 4. Table 3-131 presents the anticipated amount of disturbance to vegetation communities in Segment 4. The distribution of vegetation communities in the B2H Project area is displayed on MV-7.

Table 3-130. Vegetation Resources Inventory Data and Residual Impacts on Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Inventory														Residual Impacts[1]	
		Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe	Moderate	Low
Applicant's Proposed Action	40.1	0.0	0.0	1.5	0.0	0.0	1.3	0.0	0.0	0.0	1.3	7.3	8.6	0.0	3.9	16.2	30.0	10.1
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.4*	*0.3*	*1.7*	*0.0*	*0.7*	*2.6*	*4.2*	*1.7*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*0.0*	*0.0*	*0.0*	*0.7*	*0.2*	*1.7*	*0.0*	*0.6*	*2.3*	*4.3*	*1.7*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.7*	*0.4*	*1.5*	*0.0*	*0.6*	*2.5*	*4.6*	*1.5*
Tub Mountain South	40.5	2.1	0.0	1.8	0.5	0.1	1.3	0.0	0.0	0.0	0.9	1.0	16.3	0.0	4.4	12.1	20.2	20.3
Willow Creek	34.6	1.0	0.0	1.2	0.0	0.0	0.3	0.0	0.0	0.0	0.4	0.8	9.8	0.0	4.3	16.8	22.6	12.0

Table Note: [1]High residual impacts on vegetation communities are not anticipated to occur.

Table 3-131. Anticipated Disturbance for Vegetation Resources for Segment 4—Brogan (acres)

Alternative Route	Total Disturbance (acres)	Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe
Applicant's Proposed Action	953	0	0	35	0	0	31	0	0	0	31	173	203	0	92	383
Variation S4-A1	*154*	*0*	*0*	*0*	*0*	*0*	*5*	*0*	*0*	*0*	*10*	*8*	*44*	*0*	*18*	*68*
Variation S4-A2	*149*	*0*	*0*	*0*	*0*	*0*	*13*	*0*	*0*	*0*	*18*	*5*	*43*	*0*	*15*	*58*
Variation S4-A3	*153*	*0*	*0*	*0*	*0*	*0*	*10*	*0*	*0*	*0*	*18*	*10*	*38*	*0*	*15*	*64*
Tub Mountain South	901	47	0	40	11	2	29	0	0	0	20	22	363	0	98	269
Willow Creek	777	22	0	27	0	0	7	0	0	0	9	18	220	0	97	377

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush and Native Grassland vegetation communities. Moderate residual impacts also are expected where the Applicant's Proposed Action Alternative crosses RCA, Mountain Shrub, and Dwarf Sagebrush Steppe vegetation communities. Low residual impacts are expected where the Applicant's Proposed Action Alternative crosses Non-native Grassland communities. Of the alternative routes considered in Segment 4, the Applicant's Proposed Action Alternative would result in the greatest extent of moderate impacts on vegetation communities.

Several wildfires have affected vegetation communities crossed by the Applicant's Proposed Action Alternative, and the current vegetation communities may no longer reflect the vegetation communities identified from the NWGAP data and the assessment of initial and residual impacts. Vegetation communities affected by wildfires can take decades to recover to predisturbance conditions, but are assumed to eventually return to predisturbance conditions, unless weed invasion and fire regime alteration cause native vegetation communities to transition to communities more typical of Non-native Grasslands. The departure from normal of native vegetation communities affected by wildfire is heavily influenced by pre-existing conditions, as well as other factors, including vegetation community type, fire severity, and weather.

Vegetation communities with abundant and diverse native plant species, particularly those with high cover of perennial bunchgrasses, are more likely to recruit and resprout with native vegetation similar to predisturbance conditions (Miller et al. 2013). However, without detailed knowledge of the pre-existing conditions across the entirety of the alternative route for each wildfire to predict the departure from normal, the assessment of impacts assumes areas affected by recent wildfires will return to predisturbance conditions. Several design features of the B2H Project for environmental protection aimed to reduce erosion and the extent of disturbance, prevent the introduction and spread of invasive plants, and establish desirable vegetation are anticipated to minimize the risk of recently burned native vegetation communities transitioning to non-native communities as a result of B2H Project activities.

Direct and indirect effects on vegetation communities would include loss of vegetation, alterations to vegetation community structure, and increased risks of invasive plant invasion. The types of potential effects on vegetation communities are described in greater detail in Section 3.2.3.6. Several B2H Project design features are anticipated to limit these effects through reducing the extent of disturbance, preventing the spread and establishment of invasive plants, and reclaiming disturbed areas with desirable native vegetation. Refer to the list of design features applicable to vegetation communities in Section 3.2.3.4.

Where the Applicant's Proposed Action Alternative crosses RCAs, disturbance to these vegetation communities is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible, as described by B2H Project Design Features 15 and 16. Where spanning would not be feasible, the application of several selective mitigation measures aimed to reduce the creation of new access roads, soil disturbance, and vegetation removal in the right-of-way are expected to reduce

impacts from a high initial level to a moderate residual level. Table 3-95 summarizes the expected level of initial impacts, selective mitigation measures that would be applied, and resulting residual impacts on vegetation communities.

Variation S4-A1

Variation S4-A1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S4-A1 crosses Dwarf Sagebrush Steppe, RCA, Mountain Shrub, and Native Grassland vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S4-A2

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S4-A2 would be similar to Variation S4-A1. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S4-A3

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S4-A3 would be similar to Variation S4-A1. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The Tub Mountain South Alternative is expected to result in moderate impacts where the alternative crosses Tall Sagebrush Steppe, Desert Shrub, Native Grassland, and RCA vegetation communities. The Tub Mountain South Alternative is expected to result in fewer residual impacts on vegetation communities than the Applicant's Proposed Action Alternative as the Tub Mountain Alternative crosses Non-native Grassland vegetation communities to a greater extent. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Willow Creek Alternative

The Willow Creek Alternative is expected to result in moderate impacts where the alternative crosses Tall Sagebrush Steppe, Native Grassland, and RCA vegetation communities. The Willow Creek Alternative is expected to result in fewer residual impacts on vegetation communities than the Applicant's Proposed Action Alternative as the Willow Creek Alternative crosses Non-native Grassland

vegetation communities to a greater extent and is shorter in total length. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Other Alternatives

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor. As such, impacts resulting from short-term disturbance, loss or adverse modification of habitat occupied by federally listed or candidate species or individual mortality to federally listed or candidate species are not anticipated for any alternative routes considered in Segment 4. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance and prevent individual mortality in occupied habitat is anticipated to reduce impacts on federally listed or candidate plant species to low levels.

Other Sensitive Plant Species

Table 3-132 identifies the sensitive plant species known to occur in the 10-mile analysis corridor for all alternative routes and route variations in Segment 4, and summarizes the occurrence data by land-management jurisdiction and known occurrences in the 10-mile analysis corridor.

Applicant's Proposed Action Alternative

Two sensitive plant species are known to occur in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, Snake River goldenweed and white wooly buckwheat (Table 3-132).

If disturbance from B2H Project activities occurs in sensitive plant species habitats, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion or reduction and isolation of patch size. These effects are described in greater detail in Section 3.2.3.6. The criteria used to assess impacts are presented in Table 3-94. The potential impacts unique to sensitive plant species including population reduction, factors influencing severity of impacts, and the application of design features and selective mitigation measures to reduce impacts on sensitive plant species would be similar to that described for the Applicant's Proposed Action Alternative in Segment 1.

Table 3-132. Potentially Affected Sensitive Plant Species for Segment 4—Brogan

Alternative Route	Total Acres of Disturbance	White Wooly Buckwheat					Cronquist's Stickseed					Janish's Penstemon					Snake River Goldenweed					Oregon Princesplume				
		Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile			
			Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total
Applicant's Proposed Action	953	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	83	4	0	9	9	7	0	0	0	0
Variation S4-A1	*154*	*1*	*1*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*73*	*4*	*0*	*9*	*9*	*3*	*0*	*0*	*0*	*0*
Variation S4-A2	*149*	*1*	*1*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*73*	*4*	*0*	*9*	*9*	*3*	*0*	*0*	*0*	*0*
Variation S4-A3	*153*	*1*	*1*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*73*	*4*	*0*	*8*	*8*	*3*	*0*	*0*	*0*	*0*
Tub Mountain South	901	6	5	0	1	5	38	7	0	1	7	0	0	0	0	0	78	12	0	9	17	18	0	0	0	0
Willow Creek	777	1	1	0	1	1	1	0	0	0	0	1	1	0	0	1	77	7	0	10	13	7	2	0	0	2

Table Note: Some sensitive plant species occurrences may exist on multiple jurisdictions, and the sum of occurrences on federal, state, and private lands may be greater than the total

White wooly buckwheat is a perennial forb considered rare, uncommon or threatened by ORBIC (G5T3S2) based on the few known occurrences limited to southeastern Oregon. It has been identified as a Type 3 BLM species in Idaho. Population trends or species specific threats are unknown, but due to the small number of known occurrences would be sensitive to disturbances (ORBIC 2012c). ORBIC recognizes 16 occurrences of white wooly buckwheat in Oregon. However, 17 white wooly buckwheat occurrences were identified during preliminary and other BLM surveys in the region, and at least 2 occurrences are known from Idaho. Of the total 35 known white wooly buckwheat occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative in Segment 4. This occurrence exists at least partially on federal lands where resource management plans require the conservation of sensitive plant species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the extent possible. Based the number of total known occurrences, number of known occurrences in the 1-mile analysis corridor, and the existence of the occurrence on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts, but is not likely to contribute to the need to list the species under the ESA.

Snake River goldenweed is a perennial forb also considered rare, uncommon, or threatened by ORBIC (G3S3) for similar reasons as white wooly buckwheat (ORBIC 2010a). It has been identified as a Type 3 BLM species in Idaho. Population trends have been assessed for this species, and indicate declining trends at many occurrences. However, numerous occurrences are estimated to have more than 500 individuals and are considered to have substantial ecological integrity and resistance to minor disturbance (ORBIC 2010a). ORBIC recognizes 42 occurrences of Snake River goldenweed in Oregon. However, preliminary and other BLM surveys in the region identified 233 occurrences, and at least 33 other occurrences of Snake River goldenweed are known from Idaho. Of the total 308 occurrences, nine are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. Of these nine occurrences, all exist on privately owned land where impacts resulting from the B2H Project may be greater. However this species is considered endangered by the state of Oregon; and potential impacts resulting from the B2H Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the total number of occurrences, compliance with state of Oregon regulations on private lands, and the mitigation measures to avoid or reduce disturbance there would be limited impacts on the species. Implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance to Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S4-A1

The 1-mile analysis corridor for Variation S4-A1 contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S4-A1 could result in long-term disturbance to white wooly buckwheat and Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list these species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S4-A2

The 1-mile analysis corridor for Variation S4-A2 contains the same sensitive species and number of occurrences as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S4-A2 could result in long-term disturbance to white wooly buckwheat and Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list these species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S4-A3

The 1-mile analysis corridor for Variation S4-A2 contains the same sensitive species, but one less occurrence of Snake River goldenweed as the Applicant's Proposed Action Alternative.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S4-A3 could result in long-term disturbance to white wooly buckwheat and Snake River goldenweed and moderate residual impacts, but will not contribute to the need to list these species under the ESA.

The types of potential effects, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Tub Mountain South Alternative

The 1-mile analysis corridor for the Tub Mountain South Alternative includes known occurrences of Cronquist's stickseed, as well as white wooly buckwheat and Snake River goldenweed.

Cronquist's stickseed is a perennial forb considered rare, uncommon or threatened by ORBIC (G3S3) as all known occurrences are narrowly restricted to southeastern Oregon and southwestern Idaho, but several occurrences appear to have large populations with stable trends (ORBIC 2010b). It has been identified as a Type 3 BLM species in Idaho. ORBIC recognizes 46 occurrences of Cronquist's stickseed in Oregon. However, 243 occurrences were identified during preconstruction surveys and other BLM surveys in the region, and 5 occurrences were identified in Idaho. Of the 294 identified occurrences, seven are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Tub Mountain South Alternative. All seven of these occurrences are located, at least partially, on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Additionally, this species is considered threatened by the state of Oregon; and potential impacts resulting from the B2H Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the total number of occurrences, compliance with state of Oregon regulations on private lands, and the mitigation measures to avoid or reduce disturbance there would be limited impacts on the species. Implementation of the Tub Mountain South Alternative could result in long-term disturbance and moderate residual impacts on Cronquist's stickseed, but is not likely to contribute to the need to list the species under the ESA.

Similar to the Applicant's Proposed Action Alternative, implementation of the Tub Mountain South Alternative could result in long-term disturbance and moderate residual impacts on Snake River goldenweed and white wooly buckwheat, but will not contribute to the need to list these species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Willow Creek Alternative

The 1-mile analysis corridor the Willow Creek Alternative contains the greatest number of sensitive plant species and includes Janish's penstemon and Oregon princesplume, as well white wooly buckwheat and Snake River goldenweed.

Janish's penstemon is considered imperiled (G4S2) in Idaho by the IDFG based on the few known occurrences in the state and several ongoing threats (IFWIS 2016). It has been identified as a Type 3 BLM species in Idaho. Although the known occurrence of Janish's penstemon in the 1-mile analysis corridor of the Willow Creek Alternative is located in Oregon, impacts on occurrences in Oregon could affect nearby occurrences in Idaho. Janish's penstemon is distributed across several states in the western US, with occurrences known from Oregon, Idaho, Nevada, and California. IFWIS recognizes 13 occurrences in Idaho, and an additional 4 were identified in Oregon from the ORBIC and preconstruction survey datasets. Of the 17 total known occurrences, one is known to exist in the 1-mile

analysis corridor and may be affected by implementation of the Willow Creek Alternative. This occurrence is located on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the broader distribution of the species beyond the B2H Project area and the existence of the occurrence on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Willow Creek Alternative could result in long-term disturbance and moderate residual impacts on Janish's penstemon, but is not likely to contribute to the need to list the species under the ESA.

Oregon princesplume is a biennial forb considered imperiled by ORBIC (G2S2) due the limited number of known occurrences restricted to southeastern Oregon and western Idaho, of which few have stable population trends. Ongoing threats to the species include grazing, disturbance associated with mining and OHV traffic, and habitat conversion to annual grasslands (ORBIC 2012b). Population trends at several smaller occurrences have been noted as declining, but multiple occurrences appear to have excellent viability despite ongoing threats. ORBIC recognizes 63 occurrences of Oregon princesplume in Oregon. However, 118 occurrences were identified during preliminary and other BLM surveys in the regions, and at least 5 occurrences are known from Idaho. Of the 186 total known occurrences, two are known to occur in the 1-mile analysis corridor and may be affected by implementation of the B2H Project. Both of these occurrences are located on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the number of total known occurrences, and apparent species resistance to ongoing threats, implementation of the Willow Creek Alternative could result in long-term disturbance to Oregon princesplume and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes in Segment 4 would result in disturbance to native vegetation communities, which could alter vegetation community structure, soil properties, and water availability creating conditions favorable for noxious weed establishment and spread. Where this disturbance is in areas without weed infestations, the B2H Project may introduce noxious weed species through the transport of plant materials. In Segment 4, these areas exist mostly in the Tall Sagebrush and Native Grassland-dominated vegetation communities located west of Jamieson, Oregon and are crossed by the Applicant's Proposed Action Alternative and Willow Creek

alternatives. The extent of noxious weed invasion would be influenced by several factors, including the extent of B2H Project disturbance, preconstruction condition of native vegetation communities, and the distribution of noxious weeds in the surrounding area. The anticipated amounts of B2H Project disturbance to vegetation communities are summarized in Table 3-131. The types of potential effects and impacts on vegetation resources associated with noxious weed invasion, and Applicant-committed design features to reduce noxious weed invasion potential would be similar to that described for Segment 1.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes would result in disturbance and potential impacts on native vegetation communities (Table 3-131). The types of potential effects and impacts on traditional foods and ethnobotanical resources associated with B2H Project implementation, as well as the application of Applicant-committed design features to reduce disturbance to native vegetation communities and development of site-specific mitigation during government to government consultation would be similar to that described for Segment 1.

Conclusion

The Applicant's Proposed Action Alternative and all other alternative routes considered in Segment 4 would result in moderate residual impacts on vegetation communities, with the Tub Mountain South Alternative resulting in the least amount of moderate impacts as it primarily crosses Non-native Grasslands. All alternative routes would affect traditional foods or other ethnobotanical resources important to tribal groups, with the Tub Mountain South Alternative likely to result in the least impacts as it crosses primarily Non-native Grasslands less likely to support traditional foods and other ethnobotanical resources important to tribal groups.

Impacts on federally listed species are not expected for any of the alternative routes considered in Segment 4. High residual impacts on sensitive plant species are not expected for any alternative route, but all alternative routes could result in long-term disturbance and moderate impacts on several sensitive plant species occurrences. Based on the available sensitive plant species occurrence data, the Tub Mountain South Alternative could affect the greatest number of occurrences and the Applicant's Proposed Action Alternative could affect the fewest occurrences.

All alternative routes would result in disturbance to native vegetation communities and increase the potential establishment and spread of noxious weeds or other invasive plants. The Applicant's Proposed Action and Willow Creek alternatives cross areas with few identified noxious weed infestations and could introduce noxious weeds or other invasive plants to these areas.

None of the alternative routes considered in Segment 4 would clearly result in the least overall impacts on vegetation resources. The Tub Mountain South Alternative would result in the least impacts on vegetation communities, traditional foods or other ethnobotanical resources, and the lowest likelihood of introducing noxious weeds or other invasive plants in areas with few identified noxious weed

infestations. However, the Applicant's Proposed Action Alternative could result in the least impacts on sensitive plant species.

SEGMENT 5—MALHEUR

Vegetation Communities

Table 3-133 presents the residual impacts on vegetation communities for alternative routes and route variations in Segment 5. Table 3-134 presents the anticipated amount of disturbance to vegetation communities in Segment 5. The distribution of vegetation communities in the B2H Project area is displayed on MV-7.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush vegetation communities. Moderate residual impacts also are expected where the Applicant's Proposed Action Alternative crosses RCA and Native Grassland vegetation communities. Low residual impacts are expected where the Applicant's Proposed Action Alternative crosses Non-native Grassland and Bare Ground, Cliffs, and Talus communities. Of the alternative routes considered in Segment 5, the Applicant's Proposed Action Alternative would result in the least extent of moderate impacts on vegetation communities as it crosses the greatest extent of Non-native Grassland.

Several wildfires have affected vegetation communities crossed by the Applicant's Proposed Action Alternative, and the current vegetation communities may no longer reflect the vegetation communities identified from the NWGAP data and the assessment of initial and residual impacts. Vegetation communities affected by wildfires can take decades to recover to predisturbance conditions, but are assumed to eventually return to predisturbance conditions, unless weed invasion and fire regime alteration cause native vegetation communities to transition to communities more typical of Non-native Grasslands. The departure from normal of native vegetation communities affected by wildfire is heavily influenced by pre-existing conditions, as well as other factors, including vegetation community type, fire severity, and weather. Vegetation communities with abundant and diverse native plant species, particularly those with high cover of perennial bunchgrasses, are more likely to recruit and resprout with native vegetation similar to predisturbance conditions (Miller et al. 2013). However, without detailed knowledge of the pre-existing conditions across the entirety of the alternative route for each wildfire to predict the departure from normal, the assessment of impacts assumes areas affected by recent wildfires will return to predisturbance conditions. Several B2H Project design features aimed to reduce erosion and the extent of disturbance, prevent the introduction and spread of invasive plants, and establish desirable vegetation are anticipated to minimize the risk of recently burned native vegetation communities transitioning to non-native communities as a result of B2H Project activities.

Table 3-133. Alternative Route Comparison for Vegetation Resources Inventory Data and Residual Impacts on Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Inventory															Residual Impacts[1]	
		Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe	Moderate	Low
Applicant's Proposed Action	40.4	0.0	0.0	7.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.0	10.3	0.0	2.9	18.9	22.8	17.6
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.9*	*0.0*	*0.5*	*1.4*	*1.9*	*5.5*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.9*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.8*	*0.0*	*0.7*	*1.9*	*2.7*	*4.7*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.0*	*0.7*	*1.4*	*2.2*	*0.3*
Variation S5-B2	*2.8*	*0.6*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*1.1*	*2.0*	*0.8*
Malheur S	43.5	0.0	0.0	6.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	1.2	7.9	0.0	3.9	23.3	28.6	14.9
Malheur A	43.1	0.0	0.0	6.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	2.0	6.5	0.0	3.8	24.2	30.3	12.8

Table Note: [1]High residual impacts on vegetation communities are not anticipated to occur.

Table 3-134. Anticipated Disturbance for Vegetation Resources for Segment 5—Malheur (acres)

Alternative Route	Total Disturbance (acres)	Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe
Applicant's Proposed Action	884	0	0	158	0	2	0	0	0	0	0	22	226	0	63	414
Variation S5-A1	*141*	*0*	*0*	*11*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*93*	*0*	*10*	*27*
Variation S5-A2	*147*	*0*	*0*	*18*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*75*	*0*	*14*	*38*
Variation S5-B1	*56*	*0*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*2*	*0*	*15*	*30*
Variation S5-B2	*57*	*12*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*18*	*22*
Malheur S	974	0	0	154	4	2	0	0	0	0	0	27	177	0	87	521
Malheur A	932	0	0	134	4	2	2	0	0	0	0	43	141	0	82	523

Table Note: Acres in the table are rounded and, therefore, columns may not sum exactly.

Direct and indirect effects on vegetation communities would include loss of vegetation, alterations to vegetation community structure, and increased risks of invasive plant invasion. The types of potential effects on vegetation communities are described in greater detail in Section 3.2.3.6. Several B2H Project design features are anticipated to limit these effects through reducing the extent of disturbance, preventing the spread and establishment of invasive plants, and reclaiming disturbed areas with desirable native vegetation. Refer to the list of design features applicable to vegetation communities in Section 3.2.3.4.

Where the Applicant's Proposed Action Alternative crosses RCAs, disturbance to these vegetation communities is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible, as described by Design Features 15 and 16. Where spanning would not be feasible, the application of several selective mitigation measures aimed to reduce the creation of new access roads, soil disturbance, and vegetation removal in the right-of-way are expected to reduce impacts from a high initial level to a moderate residual level. Table 3-95 summarizes the expected level of initial impacts, selective mitigation measures that would be applied, and resulting residual impacts on vegetation communities.

Variation S5-A1

Variation S5-A1 is anticipated to result in predominantly low residual impacts as it primarily crosses Non-native Grassland vegetation communities. Moderate residual impacts are expected where Variation S5-A1 crosses RCA and Tall Sagebrush Steppe vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S5-A2

Variation S5-A2 is anticipated to result in predominantly low residual impacts as it primarily crosses Non-native Grassland vegetation communities. Moderate residual impacts are expected where Variation S5-A1 crosses Desert Shrub, RCA and Tall Sagebrush Steppe vegetation communities. Variation S5-A2 is anticipated to result in greater amounts of moderate impacts on vegetation communities, as it crosses Tall Sagebrush Steppe to a greater extent than Variation S5-A2. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S5-B1

Variation S5-B1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S5-B1 crosses Native Grassland and RCA vegetation communities. Low residual impacts are expected where Variation S5-B1 crosses Non-native Grasslands and Bare Ground, Cliffs, and Talus. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation

communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S5-B2

Variation S5-B2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe and RCA vegetation communities. Low residual impacts are expected where Variation S5-B2 crosses Agriculture and Bare Ground, Cliffs, and Talus. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Malheur S Alternative

The Malheur S Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are anticipated where the Malheur S Alternative crosses RCA, Native Grassland, and Desert Shrub vegetation communities. Low residual impacts are expected where the Malheur S Alternative crosses Bare Ground, Cliffs, and Talus and Non-native Grassland vegetation communities. The Malheur S Alternative crosses Tall Sagebrush Steppe to a greater extent than the Applicant's Proposed Action Alternative, and as such is anticipated to result in greater residual impacts.

Where the Malheur S Alternative crosses the Below the Dam ACEC (Link 5-30), long-term or permanent disturbance to the black cottonwood galleries could occur as a result of vegetation clearing for (1) construction of B2H Project features or (2) maintenance of right-of-way clearances. Any disturbance to these rare galleries would cause substantial modification through limbing, felling, and clearing of individual trees and is expected to be either irreversible or persist for the time period required for germination and establishment of black cottonwood. Any disturbance to these black cottonwood galleries could result in high impacts. The extent and potential effects on this ACEC are described in greater detail in the Land Use section, Section 3.2.6. However, disturbance to these black cottonwood galleries is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible, as described by Design Features 15 and 16. Where spanning would not be feasible, the application of several selective mitigation measures aimed to reduce the creation of new access roads, soil disturbance, and vegetation removal in the right-of-way are expected to reduce impacts from a high initial level to a moderate residual level.

Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Malheur A Alternative

The Malheur A Alternative is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are anticipated where the Malheur A Alternative crosses Dwarf Sagebrush Steppe, RCA, Native Grassland, and Desert Shrub vegetation communities. Low residual impacts are expected where the Malheur A Alternative crosses Bare Ground, Cliffs, and Talus and Non-native Grassland vegetation communities. The Malheur A Alternative crosses Tall Sagebrush Steppe to a greatest extent of any alternative in Segment 5, and as such is anticipated to result in greatest residual impacts.

Similar to the Malheur S Alternative, the Malheur A Alternative crosses the Below the Dam ACEC (Link 5-35), and could result in disturbance to black cottonwood galleries. The types of effects, potential impacts, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Malheur S Alternative.

Wildfire effect on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Other Alternatives

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor. As such, impacts resulting from short-term disturbance, loss or adverse modification of habitat occupied by federally listed or candidate species, or individual mortality to federally listed or candidate species are not anticipated for any alternative route or route variation considered in Segment 5. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, or avoid disturbance and prevent individual mortality in occupied habitat is anticipated to reduce residual impacts on low levels on federally listed or candidate plant species.

Other Sensitive Plant Species

Table 3-135 identifies the sensitive plant species known to occur in the 10-mile analysis corridor for all alternatives considered in Segment 5, and summarizes the occurrence data by land-management jurisdiction and known occurrences in the 10-mile analysis corridor.

Applicant's Proposed Action Alternative

Five sensitive plant species are known to occur in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, including Mulford's milkvetch, Malheur cryptantha, Greeley's springparsley, Cronquist's stickseed, and wishbone bush (Table 3-135).

If disturbance from B2H Project activities occurs in sensitive plant species habitats, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals;

and habitat degradation through weed invasion or reduction and isolation of patch size. These effects are described in greater detail in Section 3.2.3.6. The criteria used to assess impacts are presented in Table 3-94. The potential impacts unique to sensitive plant species including population reduction, factors influencing severity of impacts, and the application of design features and selective mitigation measures to reduce impacts on sensitive plant species would be similar to that described for the Applicant's Proposed Action Alternative in Segment 1.

Mulford's milkvetch is a perennial forb considered critically imperiled by ORBIC (G2S1) due to the limited number of known extant occurrences restricted to the Snake River Floodplain in southeastern Oregon and southwestern Idaho (Mancuso 1999; ORBIC 2013c). It has been identified as a Type 2 BLM species in Idaho. Recent studies at several occurrences in southeastern Oregon demonstrate decreasing trends with annual fluctuations across seven years of observation (Gray et al. 2015). Several threats to Mulford's milkvetch were also identified, including: invasive plants, shifts in precipitation patterns from climate change and livestock use. ORBIC recognizes 14 occurrences in Oregon. However, 121 occurrences were identified from previous BLM surveys in the region, and 10 were identified in Idaho. Of the total 145 occurrences, three are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. All three of these occurrences are located on federally managed land where resource management plans require the conservation of sensitive plant species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Additionally, this species is considered endangered by the state of Oregon; and potential impacts resulting from the B2H Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the total number of occurrences, compliance with state of Oregon regulations on private lands, and the existence of several occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species there would be limited impacts on the species. Implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on Mulford's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

Table 3-135. Potentially Affected Sensitive Plant Species for Segment 5—Malheur

Alternative Route	Total Acres of Disturbance	Mulford's Milkvetch					Cusick's Pincushion					Malheur Cryptantha					Greeley's Springparsley					Saltwort buckwheat					Cronquist's Stickseed					Smooth Stickleaf					Wishbone Bush				
		Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile			
			Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total
Applicant's Proposed Action	884	13	3	0	0	3	3	0	0	0	0	6	4	0	0	4	9	4	0	0	4	1	0	0	0	0	39	6	0	1	6	7	0	0	0	0	6	3	0	1	3
Variation S5-A1	*141*	*7*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*30*	*2*	*0*	*1*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*147*	*6*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*1*	*1*	*29*	*2*	*0*	*1*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*56*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*7*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*6*	*2*	*0*	*1*	*2*
Variation S5-B2	*57*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*7*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*6*	*2*	*0*	*1*	*2*
Malheur S	974	5	0	0	0	0	7	2	0	0	2	9	4	0	0	4	9	4	0	0	4	1	0	0	0	0	15	4	0	0	4	7	0	0	0	0	6	2	0	0	2
Malheur A	932	4	0	0	0	0	7	2	0	0	2	9	0	0	0	0	9	4	0	0	4	1	0	0	0	0	15	4	0	0	4	7	1	0	0	1	5	2	0	0	2

Table Note: Some sensitive plant species occurrences may exist on multiple jurisdictions, and the sum of occurrences on federal, state, and private lands may be greater than the total.

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Greeley's springparsley is a perennial forb considered critically imperiled by ORBIC (G5T2S1) due to the few known occurrences limited to southeastern Oregon (ORBIC 2013a). It has been identified as a Type 3 BLM species in Idaho. Population trends and species specific threats are unknown, but due to the small number of known occurrences would be sensitive to disturbances. Greeley's springparsley is a variety of a more broadly distributed species, plains springparsley (*Cymopterus acaulis*), which has been the subject of taxonomic confusion. Sun et al. (2005) proposed recognizing plains springparsley and all varieties as *C. glomeratus.* For the purposes of this analysis, potential impacts on Greeley's springparsley will be considered at the variety level. ORBIC recognizes 4 occurrences of Greeley's springparsley in Oregon. However, 9 occurrences were identified from preconstruction and other BLM surveys in the region, and 12 were identified in Idaho. Of the total 25 known occurrences, four are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. All four of these occurrences are located on federally managed land where resource management plans require the conservation of sensitive plant species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the existence of several occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative is not likely to result in high levels of impact on Greeley's springparsley or contribute to the need to list the species under the ESA. High levels of impacts on Greeley's springparsley are not likely, but could occur given the limited distribution of the species, few known occurrences, and unknown population trends. If implementation of the Applicant's Proposed Action Alternative results in severe disturbance or affects the long-term persistence of multiple occurrences, high residual impacts could occur and contribute to the need to list the species under the ESA.

Cronquist's stickseed is a perennial forb considered rare, uncommon, or threatened (G3S3) by ORBIC as all known occurrences are narrowly restricted to southeastern Oregon and southwestern Idaho, but several occurrences appear to have large populations with stable trends (ORBIC 2010b). It has been identified as a Type 3 BLM species in Idaho. ORBIC recognizes 46 occurrences of Cronquist's stickseed in Oregon. However, 243 occurrences were identified during preconstruction surveys and other BLM surveys in the region, and 5 occurrences were identified in Idaho. Of the 294 identified occurrences, six are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. All six of these occurrences are located, at least partially, on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. However this species is considered threatened by the state of Oregon; and potential impacts resulting from the B2H Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the total number of occurrences, compliance with state of Oregon regulations on private lands, and the mitigation measures to avoid or reduce disturbance there would be limited impacts on the species. Implementation of the Applicant's Proposed Action

Alternative could result in long-term disturbance and moderate residual impacts on Cronquist's stickseed, but is not likely to contribute to the need to list the species under the ESA.

Malheur cryptantha is a perennial forb considered imperiled (G4S2) in Idaho by the IDFG based on the few known occurrences in the state and several ongoing threats (IFWIS 2016). It has been identified as a Type 4 BLM species in Idaho. Although the known occurrences of Malheur cryptantha in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative are located in Oregon, impacts on occurrences in Oregon could affect nearby occurrences in Idaho. Malheur cryptantha is known only from the Snake River and tributaries in Oregon and Idaho. Population trends and species specific threats are unknown, but due to the small number of known occurrences would be sensitive to disturbance (IFWIS 2016). ORBIC recognizes 20 occurrences in Oregon, 24 were identified during preconstruction and other BLM surveys in the region, and 7 were identified in Idaho. Of the 51 total known occurrences, four are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. All four occurrences are located, at least partially, on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the number of total known occurrences and the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on Malheur cryptantha, but is not likely to contribute to the need to list the species under the ESA.

Wishbone bush is a perennial species considered rare, uncommon or threatened in Oregon (G4G5T4S3) due to the few known occurrences restricted to southeastern Oregon (ORBIC 2013a). However, wishbone bush is widely distributed across the Great Basin and the occurrences contained in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative represent the northern extreme of the species distribution and the majority of the occurrences in Oregon. Population trends and species specific threats are unknown. ORBIC recognizes 8 occurrences, 2 were identified during other BLM surveys in the region, and none were identified in Idaho. Of the 10 occurrences, three are known to occur in the 1-mile analysis corridor and may be affected by the Applicant's Proposed Action Alternative. All three occurrences are located, at least partially, on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the broader distribution of the species beyond the B2H Project area and the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on wishbone bush, but is not likely to contribute to the need to list the species under the ESA.

Until the final engineering design and preconstruction surveys completed is available, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative

determination of the number of individuals affected, acres of habitat disturbed, or anticipated amount of impacts on sensitive plant species cannot be provided.

Variation S5-A1

The 1-mile analysis corridor for Variation S5-A1 contains known occurrences of Cronquist stickseed, all of which are located, at least partially, on federally managed lands.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S5-A1 could result in long-term disturbance to Cronquist's stickseed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S5-A2

The 1-mile analysis corridor for Variation S5-A2 contains one known occurrence of saltwort buckwheat, as well as the two occurrences of Cronquist stickseed contained in the 1-mile analysis corridor of Variation S5-A1.

Saltwort buckwheat is an annual forb considered imperiled (G3G4S2) by ORBIC due to the limited number of known occurrences restricted to southeastern Oregon (ORBIC 2013a). However, the species is also known from Idaho and Nevada. Population trends and species specific threats are unknown, but due to the small numbers of known occurrences are likely to be sensitive to disturbance. ORBIC recognizes 7 occurrences, 2 were identified during other BLM surveys in the region, and none were identified from Idaho. Of the 9 occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by Variation S5-A2. This occurrence is located on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the broader distribution of the species beyond the B2H Project area and the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of Variation S5-A2 could result in long-term disturbance and moderate residual impacts on saltwort buckwheat, but is not likely to contribute to the need to list the species under the ESA.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S5-A2 could result in long-term disturbance to Cronquist's stickseed and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the

exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S5-B1

The 1-mile analysis corridor for Variation S5-B1 contains known occurrences of wishbone bush near the Owyhee River. The two occurrences contained in the 1-mile analysis corridor of Variation S5-B1 also are contained in the 1-mile analysis corridor of the Applicant's Proposed Action.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S5-B1 could result in long-term disturbance to wishbone bush and moderate residual impacts, but will not contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S5-B2

The 1-mile analysis corridor for Variation S5-B2 contains the same sensitive species and number of occurrences as Variation S5-B1. The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Malheur S Alternative

The 1-mile analysis corridor for the Malheur S Alternative includes known occurrences of Cusick's pincushion, as well as Malheur cryptantha, Greeley's springparsley, Cronquist's stickseed, and wishbone bush.

Cusick's pincushion is an annual forb considered imperiled (G3S2) by in Idaho by the IDFG based on the few known occurrences in the area restricted to southwestern Idaho and southeastern Oregon (IFWIS 2016). ORBIC considers Cusick's pincushion to be rare, uncommon or threatened in Oregon (ORBIC 2013a). It has been identified as a Type 4 BLM species in Idaho. Although the known occurrences of Cusick's pincushion in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative are located in Oregon, impacts on occurrences in Oregon could affect nearby occurrences in Idaho. Being an annual species, developing population estimates and determining trends is complicated, but studies of Idaho occurrences found several ongoing threats, including OHV traffic and mineral development, as well as the extirpation of at least one known occurrence (Mosely 1994). ORBIC recognizes 21 occurrences in Oregon, 22 occurrences were identified from preconstruction and other BLM surveys in the region, and 13 occurrences were identified in Idaho. Of the total 56 known

occurrences, two are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Malheur S Alternative. Both these occurrences are located on federally managed lands where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the total number of known occurrences and the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Malheur S Alternative could result in long-term disturbance and moderate residual impacts on Cusick's pincushion, but is not likely to contribute to the need to list the species under the ESA.

Similar to the Applicant's Proposed Action Alternative, implementation of the Malheur S Alternative could result in long-term disturbance and moderate residual impacts on Malheur cryptantha, Cronquist's stickseed, and wishbone bush but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on Greeley's springparsley and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Malheur A Alternative

The 1-mile analysis corridor for the Malheur A Alternative includes known occurrences of smooth stickleaf, as well as Cusick's pincushion, Greeley's springparsley, Cronquist's stickseed, and wishbone bush.

Smooth stickleaf is annual forb considered imperiled (G2S2) by ORBIC due to the limited number of known occurrences restricted ash outcrops in southeastern Oregon and southwestern Idaho (ORBIC 2013a). It has been identified as a Type 2 BLM species in Idaho. Population trends for smooth stickleaf are difficult to determine being an annual species, but the most recent observations of several occurrences identify several with over 1,000 individuals and excellent viability. The species is considered particularly sensitive to soil compaction resulting from grazing and OHV use. ORBIC recognizes 20 occurrences in Oregon, 36 were identified during preconstruction and other BLM surveys in the region, and 15 were identified in Idaho. Of the total 71 known occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by the Malheur A Alternative. This occurrence is located on federally managed lands where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Additionally, this species is considered endangered by the state of Oregon; and potential impacts resulting from the B2H Project implementation would be avoided or minimized to the greatest extent possible to prevent a significant reduction in the likelihood of survival or recovery of the species. Based on the total number of occurrences, compliance with state of Oregon regulations on private lands, and the mitigation measures to avoid or reduce disturbance there

would be limited impacts on the species. Implementation of the Malheur A Alternative could result in long-term disturbance and moderate residual impacts on smooth stickleaf, but is not likely to contribute to the need to list the species under the ESA.

Similar to the Applicant's Proposed Action Alternative and the Malheur S Alternative, implementation of the Malheur A Alternative could result in long-term disturbance and moderate residual impacts on Cusick's pincushion, Cronquist's stickseed, and wishbone bush but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on Greeley's springparsley and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Noxious Weeds

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes in Segment 5 would result in disturbance to native vegetation communities, which could alter vegetation community structure, soil properties, and water availability creating conditions favorable for noxious weed establishment and spread. Where this disturbance is in areas without weed infestations, the B2H Project may introduce noxious weed species through the transport of plant materials. In Segment 5, these areas exist mostly in the Tall Sagebrush-dominated vegetation communities located near Grassy Mountain and are crossed by the Malheur S and Malheur A alternatives. The extent of noxious weed invasion would be influenced by several factors, including the extent of B2H Project disturbance, preconstruction condition of native vegetation communities, and the distribution of noxious weeds in the surrounding area. The anticipated amounts of B2H Project disturbance to vegetation communities are summarized in Table 3-134. The types of potential effects and impacts on vegetation resources associated with noxious weed invasion, and Applicant-committed design features to reduce noxious weed invasion potential would be similar to that described for Segment 1.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Other Alternatives

The Applicant's Proposed Action Alternative and all other alternative routes would result in disturbance and potential impacts on native vegetation communities (Table 3-134). The types of potential effects and impacts on traditional foods and ethnobotanical resources associated with B2H Project implementation, as well as the application of Applicant-committed design features to reduce disturbance to native vegetation communities and development of site-specific mitigation during government to government consultation would be similar to that described for Segment 1.

Conclusion

The Applicant's Proposed Action Alternative and all other alternative routes considered in Segment 5 would result in predominantly moderate impacts on vegetation communities, with the Applicant's Proposed Action resulting in the least amount of impacts as it is the shortest alternative route considered in Segment 5 and crosses Tall Sagebrush Steppe vegetation communities to the least extent. The Malheur S and Malheur A alternatives cross the Below the Dam ACEC and could impact the rare black cottonwood galleries in the ACEC. All alternative routes would have similar impacts on traditional foods and other ethnobotanical resources important to tribal groups.

Impacts on federally listed species are not expected for any of the alternative routes considered in Segment 5. High and moderate residual impacts on sensitive species could occur for all alternative routes, and the Applicant's Proposed Action Alternative could additionally result in moderate residual impacts on known occurrences of Mulford's milkvetch. Based on available data, the Malheur S and Malheur A alternatives could affect a similar amount of sensitive plant species and occurrences.

All alternative routes would result in disturbance to native vegetation communities and increase the potential establishment and spread of noxious weeds or other invasive plants. The Malheur S and Malheur A alternatives cross areas with few identified noxious weed infestations and could introduce noxious weeds or other invasive plants to these areas.

None of the alternative routes considered in Segment 5 would clearly result in the least overall impacts on vegetation resources. The Applicant's Proposed Action Alternative would result in the least impacts on vegetation communities, traditional foods or other ethnobotanical resources, and the lowest likelihood of introducing noxious weeds or other invasive plants in areas with few identified noxious weed infestations. However, the Malheur S and Malheur A alternatives could result in the least impacts on sensitive plant species.

SEGMENT 6—TREASURE VALLEY

Vegetation Communities

Table 3-136 presents the residual impacts on vegetation communities for alternative routes and route variations in Segment 6. Table 3-137 presents the anticipated amount of disturbance to vegetation communities in Segment 6. The distribution of vegetation communities in the B2H Project area is displayed on MV-7.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is anticipated to result in predominantly moderate residual impacts on vegetation communities as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where the Applicant's Proposed Action Alternative crosses RCA and Desert Shrub vegetation communities. The Applicant's Proposed Action is anticipated to result in low residual impacts where it crosses Non-native Grassland, Agriculture, Bare Ground, Cliffs and Talus, and Developed/Disturbed vegetation communities.

Table 3-136. Vegetation Resources Inventory Data and Residual Impacts on Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Inventory														Residual Impacts[1]	
		Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe	Moderate	Low
Applicant's Proposed Action	28.0	0.2	0.0	0.9	2.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	2.2	10.5	15.0	13.0
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.2*	*0.0*	*1.0*	*4.0*	*5.1*	*4.2*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.2*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.7*	*0.0*	*0.3*	*4.6*	*5.0*	*3.9*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*0.9*	*1.3*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.5*	*0.0*	*0.7*	*5.9*	*7.9*	*6.5*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*1.5*	*0.7*	*0.2*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.3*	*2.9*	*0.0*	*0.8*	*7.6*	*9.5*	*4.6*

Table Note: [1]High residual impacts on vegetation communities are not anticipated to occur.

Table 3-137. Anticipated Disturbance for Vegetation Resources for Segment 6—Treasure Valley (acres)

Alternative Route	Total Disturbance (acres)	Agriculture	Aspen	Bare Ground, Cliffs, Talus	Desert Shrub	Developed/Disturbed	Dwarf Sagebrush Steppe	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Mountain Shrub	Native Grasslands	Non-Native Grasslands	Open Water	Riparian Conservation Area	Tall Sagebrush Steppe
Applicant's Proposed Action	613	4	0	20	50	2	0	0	0	0	0	0	258	0	48	230
Variation S6-A1	*205*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*93*	*0*	*22*	*88*
Variation S6-A2	*196*	*0*	*0*	*4*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*81*	*0*	*7*	*101*
Variation S6-B1	*312*	*0*	*0*	*19*	*28*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*119*	*0*	*15*	*128*
Variation S6-B2	*309*	*0*	*0*	*33*	*15*	*4*	*0*	*0*	*2*	*0*	*0*	*7*	*64*	*0*	*18*	*166*

Table Note: Acres in the table are rounded and, therefore, columns may not sum exactly.

The Soda fire has affected vegetation communities crossed by the Applicant's Proposed Action Alternative, and the current vegetation communities may no longer reflect the vegetation communities identified from the NWGAP data and the assessment of initial and residual impacts. Vegetation communities affected by wildfires can take decades to recover to predisturbance conditions, but are assumed to eventually return to predisturbance conditions, unless weed invasion and fire regime alteration cause native vegetation communities to transition to communities more typical of Non-native Grasslands. The departure from normal of native vegetation communities affected by wildfire is heavily influenced by pre-existing conditions, as well as other factors, including vegetation community type, fire severity, and weather. Vegetation communities with abundant and diverse native plant species, particularly those with high cover of perennial bunchgrasses, are more likely to recruit and resprout with native vegetation similar to predisturbance conditions (Miller et al. 2013). Substantial management efforts to stabilize, rehabilitate and restore areas burned during the Soda fire have been undertaken, including treatment of invasive plants, reseeding, grazing management, and other adaptive management strategies (BLM 2015). Seeding efforts are aimed to promote the re-establishment of vegetation similar to Tall Sagebrush Steppe, Dwarf Sagebrush Steppe, and Native Grassland vegetation communities, and reduce the extent of existing Non-native Grassland vegetation communities in the region. However, without detailed knowledge of the pre-existing conditions across the entirety of the alternative route for each wildfire to predict the departure from normal or current success of rehabilitation activities, the assessment of impacts assumes areas affected by recent wildfires will return to predisturbance conditions.

Several B2H Project design features aimed to reduce erosion and the extent of disturbance, prevent the introduction and spread of invasive plants, and establish desirable vegetation are anticipated to minimize the risk of recently burned native vegetation communities transitioning to non-native communities as a result of B2H Project activities.

Direct and indirect effects on vegetation communities would include loss of vegetation, alterations to vegetation community structure, and increased risks of invasive plant invasion. The types of potential effects on vegetation communities are described in Section 3.2.3.6. Several B2H Project design features are anticipated to limit these effects through reducing the extent of disturbance, preventing the spread and establishment of invasive plants, and reclaiming disturbed areas with desirable native vegetation. Refer to the list of design features applicable to vegetation communities in Section 3.2.3.4.

Where the Applicant's Proposed Action Alternative crosses RCAs, disturbance to these vegetation communities is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible, as described by Design Features 15 and 16. Where spanning would not be feasible, the application of several selective mitigation measures aimed to reduce the creation of new access roads, soil disturbance, and vegetation removal in the right-of-way are expected to reduce impacts from a high initial level to a moderate residual level. Table 3-95 summarizes the expected level of initial impacts, selective mitigation measures that would be applied, and resulting residual impacts on vegetation communities.

Variation S6-A1

Variation S6-A1 is anticipated to result in predominantly moderate residual impacts as it crosses greater amounts of Tall Sagebrush Steppe, Desert Shrub, and RCA vegetation communities than Non-native Grasslands. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S6-A2

The extent of disturbance to vegetation communities and residual impacts resulting from Variation S6-A2 would be similar to Variation S6-A1. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S6-B1

Variation S6-B1 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S6-B1 crosses Desert Shrub and RCA vegetation communities. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Variation S6-B2

Variation S6-B2 is anticipated to result in predominantly moderate residual impacts as it primarily crosses Tall Sagebrush Steppe vegetation communities. Moderate residual impacts also are expected where Variation S6-B1 crosses Desert Shrub and RCA vegetation communities. Variation S6-B2 is expected to result in greater amounts of residual impacts than Variation S6-B1, as it crosses Tall Sagebrush Steppe to a greater extent. Wildfire effects on native vegetation communities, direct and indirect effects on vegetation communities, and the application of design features and selective mitigation measures to reduce the anticipated levels of residual impacts on vegetation communities would be similar to that described for the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Plant Species

Applicant's Proposed Action Alternative and All Variations

Federally listed or candidate plant species are not known to occur within the 10-mile or 1-mile analysis corridor. As such, impacts resulting from short-term disturbance, loss or adverse modification of habitat occupied by federally listed or candidate species, or individual mortality to federally listed or candidate species are not anticipated for the Applicant's Proposed Action Alternative or any variations in Segment 6. If federally listed or candidate plant species are found during preconstruction surveys as required by Design Feature 4, the application of Selective Mitigation Measures 8 and 13 to span, reduce, avoid

disturbance and prevent individual mortality in occupied habitat is anticipated to reduce impacts on low levels on federally listed or candidate plant species.

Other Sensitive Plant Species

Table 3-138 identifies the sensitive plant species known to occur in the 10-mile analysis corridor for all alternatives considered in Segment 6, and summarized the occurrence data by land-management jurisdiction and known occurrences in the 10-mile analysis corridor.

Applicant's Proposed Action Alternative

Eight sensitive plant species are known to occur in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative, including Mulford's milkvetch, Cusick's pincushion, Malheur cryptantha, Greeley's springparsley, false naked buckwheat, carveseed, smooth stickleaf, and Janish's penstemon (Table 3-138). Known occurrences of Greeley's springparsley in the 1-mile analysis corridor of the Applicant's Proposed Action Alternative are located in both Oregon and Idaho. Occurrences of all other species are located only in Idaho.

If disturbance from B2H Project activities occurs in sensitive plant species habitats, several direct and indirect effects may occur, including loss of habitat; mortality or other adverse effects on individuals; and habitat degradation through weed invasion or reduction and isolation of patch size. These effects are described in greater detail in Section 3.2.3.6. The criteria used to assess impacts are presented in Table 3-94. The potential impacts unique to sensitive plant species including population reduction, factors influencing severity of impacts, and the application of design features and selective mitigation measures to reduce impacts on sensitive plant species would be similar to that described for the Applicant's Proposed Action Alternative in Segment 1.

Mulford's milkvetch is a perennial forb considered imperiled (G2S1) by the IDFG due to the limited number of known extant occurrences restricted to the Snake River Floodplain in southeastern Oregon and southwestern Idaho (IFWIS 2016; Mancuso 1999). It has been identified as a Type 2 BLM species in Idaho. Population trends in Idaho are unknown, but recent studies at several occurrences in southeastern Oregon demonstrate decreasing trends with annual fluctuations across seven years of observation (Gray et al. 2015). Several threats to Mulford's milkvetch were also identified, including: invasive plants, shifts in precipitation patterns from climate change, and livestock use. Ten occurrences were identified in Idaho. However, 135 occurrences were identified in Oregon from ORBIC, preconstruction surveys, and other BLM surveys. Of the total 145 occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. This occurrence is located, at least partially, on federally managed land where resource management plans require the conservation of sensitive plant species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based the number of total known occurrences, and the existence of several occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on Mulford's milkvetch, but is not likely to contribute to the need to list the species under the ESA.

Table 3-138. Potentially Affected Sensitive Plant Species for Segment 6—Treasure Valley

Alternative Route	Total Acres of Disturbance	Mulford's Milkvetch					Cusick's Pincushion					Malheur Cryptantha					Greeley's Springparsley					False Naked Buckwheat					Carveseed					Smooth Stickleaf					Janish's Penstemon				
		Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile				Within 10 Miles	Within 1 Mile			
			Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total		Federal	State	Private	Total
Applicant's Proposed Action	884	2	1	0	1	1	6	3	0	0	3	8	1	0	1	1	9	7	0	1	8	1	1	0	1	1	5	1	1	1	1	12	3	1	0	4	5	1	0	0	1
Variation S6-A1	*141*	*0*	*0*	*0*	*0*	*0*	*4*	*2*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*0*	*9*	*3*	*0*	*1*	*4*	*1*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*9*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*
Variation S6-A2	*147*	*0*	*0*	*0*	*0*	*0*	*3*	*2*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*0*	*9*	*3*	*0*	*1*	*4*	*1*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*8*	*0*	*0*	*0*	*0*	*3*	*2*	*0*	*0*	*2*
Variation S6-B1	*56*	*1*	*0*	*0*	*0*	*0*	*4*	*2*	*0*	*0*	*2*	*4*	*1*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*1*	*1*	*4*	*1*	*1*	*1*	*1*	*4*	*3*	*1*	*0*	*4*	*2*	*1*	*0*	*0*	*1*
Variation S6-B2	*57*	*1*	*0*	*0*	*0*	*0*	*4*	*2*	*0*	*0*	*2*	*4*	*1*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*0*	*1*	*4*	*1*	*1*	*1*	*1*	*4*	*3*	*1*	*0*	*4*	*2*	*1*	*0*	*0*	*1*

Table Note: Some sensitive plant species occurrences may exist on multiple jurisdictions, and the sum of occurrences on federal, state, and private lands may be greater than the total

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Greeley's springparsley is a perennial forb considered critically imperiled (G5T2S1) by ORBIC due to the few known occurrences limited to southeastern Oregon, and imperiled (G5T2S2) by the IDFG in Idaho (IFWIS 2016; ORBIC 2013a). It has been identified as a Type 3 BLM species in Idaho. Population trends and species specific threats are unknown, but due to the small number of known occurrences, it would be sensitive to disturbances. Greeley's springparsley is a variety of a more broadly distributed species, plains springparsley (*Cymopterus acaulis*), which has been the subject of taxonomic confusion. Sun et al. (2005) proposed recognizing plains springparsley and all varieties as *C. glomeratus.* For the purposes of this analysis, potential impacts on Greeley's springparsley will be considered at the variety level. ORBIC recognizes 4 occurrences of Greeley's springparsley in Oregon. However, 9 occurrences were identified from preconstruction and other BLM surveys in the region, and 12 were identified in Idaho. Of the total 25 known occurrences, eight are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. Seven of these occurrences are located on federally managed land where resource management plans require the conservation of sensitive plant species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. One occurrence exists on privately owned lands where impacts resulting from the B2H Project may be greater. Based on the existence of several occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative is not likely to result in high levels of impact on Greeley's springparsley or contribute to the need to list the species under the ESA. High levels of impacts on Greeley's springparsley are not likely, but could occur given the limited distribution of the species, potential severe disturbance to occurrences located on private lands, few known occurrences, and unknown population trends. If implementation of the Applicant's Proposed Action Alternative results in severe disturbance or affects the long-term persistence of multiple occurrences, high residual impacts could occur and contribute to the need to list the species under the ESA.

False naked buckwheat is considered critically imperiled (G4S1) in Idaho by the IDFG based on the sole occurrence in Idaho which faces ongoing threats and declining trends (Wigglesworth 2012). It has been identified as a Type 3 BLM species in Idaho. False naked buckwheat is known to occur in the Leslie Gulch area of southeastern Oregon, but no occurrences were identified by ORBIC, preconstruction surveys, or other surveys in the region. The three occurrences in Idaho recognized by IFWIS are within 0.25 miles of each other and are considered a single occurrence by the IDFG. All known occurrences in Idaho are known to occur in the 1-mile analysis corridor and may be affected by the Applicant's Proposed Action Alternative. All occurrences exist on federally managed land where resource management plans require the conservation of sensitive plant species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species and assumed distribution of the species in Oregon, implementation of the Applicant's Proposed Action Alternative is not likely to result in high levels of impact on false naked buckwheat or contribute to the need to list the species under the ESA. High levels of impacts on false naked buckwheat are not likely, but could occur given

the limited distribution of the species, unknown distribution in Oregon, and unknown population trends. If implementation of the Applicant's Proposed Action Alternative results in severe disturbance or affects the long-term persistence of multiple occurrences, high residual impacts could occur and contribute to the need to list the species under the ESA.

Smooth stickleaf is annual forb considered imperiled (G2S2) by IFWIS due to the limited number of known occurrences restricted ash outcrops in southeastern Oregon and southwestern Idaho (IFWIS 2016). It has been identified as a Type 2 BLM species in Idaho. Population trends for smooth stickleaf are difficult to determine being an annual species, but the most recent observations of several occurrences identify several with over 1,000 individuals and excellent viability. The species is considered particularly sensitive to soil compaction resulting from grazing and OHV use. IFWIS recognizes 15 occurrences in Oregon and 56 were identified in Oregon by ORBIC, preconstruction surveys, and other BLM surveys in the region. Of the total 71 known occurrences, four are known to occur in the 1-mile analysis corridor and may be affected by the Applicant's Proposed Action Alternative. These occurrences are located on state or federally managed lands where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the total number of known occurrences and the existence of the occurrences on state or federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on smooth stickleaf, but is not likely to contribute to the need to list the species under the ESA.

Malheur cryptantha is a perennial forb considered imperiled (G4S2) in Idaho by the IDFG based on the few known occurrences in the state and several ongoing threats (IFWIS 2016). It has been identified as a Type 4 BLM species in Idaho. Malheur cryptantha is known only from the Snake River and tributaries in Oregon and Idaho. Population trends and species specific threats are unknown, but due to the small number of known occurrences would be sensitive to disturbance (IFWIS 2016). IFWIS recognizes 7 occurrences in Idaho, 44 were identified in Oregon by ORBIC, preconstruction surveys, other BLM surveys in the region. Of the 51 total known occurrences, one is known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. This occurrence is located, at least partially, on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the number of total known occurrences and the existence of the occurrence on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on Malheur cryptantha, but is not likely to contribute to the need to list the species under the ESA.

Cusick's pincushion is an annual forb considered imperiled (G3S2) in Idaho by the IDFG based on the few known occurrences in the area restricted to southwestern Idaho and southeastern Oregon (IFWIS

2016). It has been identified as a Type 2 BLM species in Idaho. Being an annual species, developing population estimates and determining trends is complicated, but studies of Idaho occurrences found several ongoing threats, including OHV traffic and mineral development, as well as the extirpation of at least one known occurrence (Mosely 1994). IFWIS recognizes 13 occurrences in Idaho and 43 occurrences were identified by ORBIC, preconstruction surveys, and other BLM surveys. Of the total 56 known occurrences, three are known to occur in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. All of these occurrences are located on federally managed lands where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the total number of known occurrences and the existence of the occurrences on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on Cusick's pincushion, but is not likely to contribute to the need to list the species under the ESA.

Janish's penstemon is considered imperiled in Idaho (G4S2) by the IDFG based on the few known occurrences in the state and several ongoing threats (IFWIS 2016). It has been identified as a Type 3 BLM species in Idaho. Janish's penstemon is distributed across several states in the western US, with occurrences known from Oregon, Idaho, Nevada, and California. IFWIS recognizes 13 occurrences in Idaho, and an additional 4 were identified in Oregon from the ORBIC and preconstruction survey datasets. Of the 17 total known occurrences, one is known to exist in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. This occurrence is located on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the broader distribution of the species beyond the B2H Project area and the existence of the occurrence on federally managed land where several mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on Janish's penstemon, but is not likely to contribute to the need to list the species under the ESA.

Carveseed is considered rare, uncommon, or threatened (G4G5S3) by the IDFG based on the few known occurrences and limited distribution in the state (IFWIS 2016). It has been identified as a Type 4 BLM species in Idaho. Carveseed is distributed across several states in the western US, with occurrences known form Oregon, Idaho, Nevada, Utah and California. IFWIS recognizes 12 occurrences in Idaho and 6 were identified in Oregon by other BLM surveys in the region. Of the total 18 occurrences, one is known to exist in the 1-mile analysis corridor and may be affected by implementation of the Applicant's Proposed Action Alternative. This occurrence is located, at least partially, on federally managed land where resource management plans require the conservation of sensitive species and potential impacts resulting from B2H Project implementation will be avoided or minimized to the greatest extent possible. Based on the broader distribution of the species beyond the B2H Project area and the existence of the occurrence on federally managed land where several

mitigation measures to avoid or reduce disturbance would limit impacts on the species, implementation of the Applicant's Proposed Action Alternative could result in long-term disturbance and moderate residual impacts on carveseed, but is not likely to contribute to the need to list the species under the ESA.

Until the final engineering design and results from preconstruction surveys are available, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative determination of the number of individuals affected, acres of habitat disturbed, or anticipated amount of impacts on sensitive plant species cannot be provided.

Variation S6-A1

The 1-mile analysis corridor for Variation S6-A1 contains known occurrences of Cusick's pincushion, and Greeley's springparsley. Besides one occurrence of Greeley's springparsley on private land, all sensitive plant species occurrences in the 1-mile analysis corridor for Variation S6-A1 exist, at least partially on federally managed land.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S6-A1 could result in long-term disturbance and moderate residual impacts on Cusick's pincushion but would not contribute to the need to list the species under the ESA, but may result in high residual impacts on Greeley's springparsley and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S6-A2

The 1-mile analysis corridor for Variation S6-A2 contains known occurrences of Janish's penstemon, as well as Cusick's pincushion, and Greeley's springparsley. Besides one occurrence of Greeley's springparsley on private land, all sensitive plant species occurrences in the 1-mile analysis corridor for Variation S6-A2 exist, at least partially on federally managed land. Some of the Greeley's springparsley occurrences are different than those contained in the 1-mile analysis corridor of the Variation S6-A1, but the total number of occurrences is the same.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S6-A2 could result in long-term disturbance and moderate residual impacts on Cusick's pincushion and Janish's penstemon but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on Greeley's springparsley and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the

exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S6-B1

The 1-mile analysis corridor for Variation S6-B1 contains known occurrences of Cusick's pincushion, Malheur cryptantha, false naked buckwheat, carveseed, smooth stickleaf, and Janish's penstemon. All sensitive plant species occurrences in the 1-mile analysis corridor for Variation S6-B1 exist, at least partially on federally managed land.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S6-B1 could result in long-term disturbance and moderate residual impacts on Cusick's pincushion, Malheur cryptantha, carveseed, smooth stickleaf, and Janish's penstemon but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on false naked buckwheat and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Variation S6-B2

The 1-mile analysis corridor for Variation S6-B2 contains the same species and occurrences as the 1-mile analysis corridor of Variation S6-B1.

Similar to the Applicant's Proposed Action Alternative, implementation of Variation S6-B2 could result in long-term disturbance and moderate residual impacts on Cusick's pincushion, Malheur cryptantha, carveseed, smooth stickleaf, and Janish's penstemon but would not contribute to the need to list these species under the ESA, but may result in high residual impacts on false naked buckwheat and contribute to the need to list the species under the ESA.

The types of potential effects and impacts, application of mitigation measures based on preconstruction surveys, and anticipated residual impacts on sensitive plant species would be similar to the Applicant's Proposed Action Alternative. The amount of impacts on sensitive plant species would depend on the exact location of B2H Project features in relation to sensitive plant species and habitats, which would be determined from the results of preconstruction surveys.

Noxious Weeds

Applicant's Proposed Action Alternative and All Variations

The Applicant's Proposed Action Alternative and all variations in Segment 6 would result in disturbance to native vegetation communities, which could alter vegetation community structure, soil properties, and water availability creating conditions favorable for noxious weed establishment and spread. Where this disturbance is in areas without weed infestations, the B2H Project may introduce noxious weed species through the transport of plant materials. The anticipated amounts of B2H Project disturbance to

vegetation communities are summarized in Table 3-137. The types of potential effects and impacts on vegetation resources associated with noxious weed invasion, and Applicant-committed design features to reduce noxious weed invasion potential would be similar to that described for Segment 1.

Traditional Foods and Ethnobotanical Resources

Applicant's Proposed Action Alternative and All Variations

The Applicant's Proposed Action Alternative and all other alternative routes would result in disturbance and potential impacts on native vegetation communities (Table 3-137). The types of potential effects and impacts on traditional foods and ethnobotanical resources associated with B2H Project implementation, as well as the application of Applicant-committed design features to reduce disturbance to native vegetation communities and development of site-specific mitigation during government to government consultation would be similar to that described for Segment 1.

Conclusion

The Applicant's Proposed Action Alternative and all variations considered in Segment 6 would result in predominantly moderate impacts on vegetation communities, with variation S6-A2 and S6-B1 resulting in the least moderate impacts. All variations would have similar impacts on traditional foods and other ethnobotanical resources important to tribal groups.

Impacts on federally listed species are not expected for the Applicant's Proposed Action Alternative or any variations considered in Segment 6. High and moderate residual impacts on sensitive plant species could occur for the Applicant's Proposed Action Alternative and all variations. Based on the available occurrence data, Variation S6-A1 could affect fewer occurrences than Variation S6-A2 and variations S6-B1 and S6-B2 would affect occurrences similarly.

All variations would result in disturbance to native vegetation communities, increase the potential establishment and spread of noxious weeds and other invasive plants, and cross areas with few identified noxious weed infestations and introduce noxious weeds and other invasive plants to these areas.

Variation S6-B1 would result in less overall impacts on vegetation resources than Variation S6-B2 as it results in less moderate impacts on vegetation communities. Neither Variation S6-A1 nor Variation S6-A2 clearly results in the least overall impacts on vegetation resources. Variation S6-A2 would result in less moderate impacts on vegetation communities than Variation S6-A1, but could result in greater impacts on sensitive plant species.

3.2.4 WILDLIFE RESOURCES

3.2.4.1 INTRODUCTION

Wildlife resources include terrestrial and some aquatic animal species and the habitats they depend on to survive and reproduce. Wildlife habitats provide animals with cover from weather and predators; food and water for nourishment; and space to obtain food and water and to attract a mate. Although all wildlife species are important members of native communities and ecosystems, most species are common and have wide distributions within the B2H Project area, the state, and the region. Consequently, the relationship of most of these species to the B2H Project is not discussed here in the same depth as the relationship of the species on which the decision-making agencies place management emphasis. Species that warrant increased management attention and, thus, will be discussed in detail below include ESA candidate, proposed, threatened, and endangered species; BLM and USFS special status species; migratory birds; raptors; USFS management indicator species (MIS) (refer to Appendix F); Oregon endangered, threatened, critical, and vulnerable species; and other species of socioeconomic importance (e.g., big game).

3.2.4.2 REGULATORY FRAMEWORK

Implementation of the B2H Project would be consistent with statutes, regulations, plans, programs, and policies of federal agencies, state and local governments, and affiliated tribes.

FEDERAL

Endangered Species Act

The Federal ESA was enacted in 1973. This law established a regulatory system to protect species that are at risk of extinction. Species listed under the ESA are protected from any action that would constitute a "take," which is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting the species, or attempting to engage in any such conduct. Under Section 7, the ESA requires that "each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical" (16 U.S.C. 35 1531–1544).

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (Eagle Act) prohibits take, possession of, selling, purchasing, bartering, or transportation of live or dead bald or golden eagles or any parts, nests, or eggs of these birds. Under the Eagle Act, "take" includes pursuing, shooting, poisoning, wounding, killing, capturing, molesting, and disturbing. The USFWS has developed the *National Bald Eagle Management Guidelines*, which provide general recommendations for activities that occur near bald eagle roosts and nests. These guidelines are not law but are meant to help landowners and agencies avoid violating the Eagle Act and, in turn, prosecution. On September 11, 2009, the USFWS published

new guidelines and regulations specifying the conditions under which incidental take permits could be authorized under the Eagle Act (74 *Federal Register* 46836).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712, July 3, 1918, as amended in 1936, 1960, 1969, 1974, 1978, 1986, and 1989) was enacted in 1918 to put an end to the commercial trade of migratory birds and their feathers. This act decrees that all migratory birds and their parts (including eggs, nests, and feathers) are fully protected (USFWS 2015). Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, possess, sell, barter, purchase, deliver, transport, or receive any migratory birds (including parts, nests, eggs, or other products, manufactured or not). The MBTA provides a framework for state-managed hunting of some species and authorizes the issuance of permits for take of other birds under limited conditions such as for falconry, research, conservation, and to prevent crop predations.

Executive Order 13816— Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186 (January 10, 2001; "Responsibilities of Federal Agencies to Protect Migratory Birds") directs federal agencies to avoid or minimize the negative impact of their actions on migratory birds and to take active steps to protect birds and their habitat. The Executive Order also requires federal agencies to ensure that environmental analyses of federal actions required by NEPA, or other established environmental review processes, evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern. This includes developing and implementing a Memorandum of Understanding (MOU) with the USFWS promoting the conservation of migratory bird populations to guide conformance with the MBTA.

Bureau of Land Management and U.S. Fish and Wildlife Service Memorandum of Understanding

The BLM entered into an MOU with the USFWS dated April 12, 2010, to identify and implement strategies that promote conservation of migratory birds and to avoid or minimize adverse impacts on migratory birds. Under the MOU, the BLM, in coordination with the USFWS, is to develop conservation measures and ensure monitoring of conservation measures to minimize, reduce, or avoid unintentional take.

The purpose of the MOU is, "to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration between the BLM and the USFWS and in coordination with state, tribal, and local governments" (BLM and USFWS 2010).

Among the BLM's responsibilities under the MOU are the following:

> Address the conservation of migratory bird habitat and populations when developing, amending, or revising management plans for BLM lands, consistent with the Federal

> Land Policy and Management Act, Endangered Species Act, and other applicable law. When developing the list of species to be considered in the planning process, BLM will consult the current USFWS Species of Concern lists. Under the MOU, the BLM agrees to consult the current listing of USFWS Birds of Conservation Concern, 2008 (BCC) (BLM and USFWS 2010)

The BLM's responsibilities also include "In coordination with the FWS, develop conservation measures and ensure monitoring of the effectiveness of conservation measures to minimize, reduce or avoid unintentional take. As needed, modify conservation measures to be more effective to reduce unintentional take, and, as practicable, to restore and enhance the habitat of migratory birds" (BLM and USFWS 2010).

Instruction Memorandum 2008-050, Migratory Bird Treaty Act – Interim Management Guidance

Instruction Memorandum 2008-050 addresses the BLM's implementation of the MBTA. The BLM Washington Office currently is developing an instruction memorandum that provides further guidance on the implementation of the BLM and USFWS MOU.

U.S. Forest Service and U.S. Fish and Wildlife Service Memorandum of Understanding

The purpose of this MOU between the USFWS and USFS is, "to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration between the Parties, in coordination with State, Tribal, and local governments" (USFS and USFWS 2008). The MOU referenced here (USFS and USFWS 2008) expired on December 8, 2013. Both parties have agreed to extend the MOU as currently written through December 31, 2017, while the parties work together to evaluate the MOU to ensure that it is meeting the stated purpose, scope, and responsibilities identified in Executive Order 13186. If deemed necessary by this evaluation of the MOU, the parties will revise relevant portions of the MOU.

Among the USFS's responsibilities under the MOU are the following:

> Address the conservation of migratory bird habitat and populations when developing, amending, or revising management plans for national forests and grasslands, consistent with NFMA [National Forest Management Act], ESA, and other authorities listed above. When developing the list of species to be considered in the planning process, consult the current FWS Birds of Conservation Concern, 2008 (BCC), State lists, and comprehensive planning efforts for migratory birds.
>
> Within the NEPA process, evaluate the effects of agency actions on migratory birds, focusing first on species of management concern along with their priority habitats and key risk factors (USFS and USFWS 2008).

The USFS's responsibilities also include to

> Coordinate with appropriate FWS Ecological Services office when planning projects that are likely to have a negative effect on migratory bird populations. Cooperate in developing approaches to minimize negative impacts and maximize benefits to migratory birds (USFS and USFWS 2008).

Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1701) as amended, consolidates and articulates BLM and USFS management responsibilities and governs most uses of federal lands, including authorization to grant or renew rights-of-way. In accordance with FLPMA, BLM, and USFS must make land-use decisions based on principles of multiple use and sustained yield. As such, a grant of right-of-way must be limited to its necessary use and must contain terms and conditions that reflect the agencies' management responsibilities under FLPMA, including minimizing impacts on fish and wildlife habitat.

National Forest Management Act

The NFMA, as amended, and its implementing regulations under 36 CFR 219 consolidate and articulate USFS management responsibilities for lands and resources of the National Forest System. NFMA regulations require that "fish and wildlife habitat be managed to maintain viable populations of existing species in the planning area." In accordance with the NFMA, each national forest and grassland is required to develop LRMPs and periodically revise them. The USFS has developed LRMPs for national forests that specify regulations, goals, and management objectives, including temporal and spatial restrictions for activities within areas managed to protect certain species and land and aquatic values. To ensure that these viable populations are maintained, the Pacific Northwest Region of the USFS has identified management requirements for a number species within the region. These MIS are emphasized because their populations can be used as an indicator of the health of a specific type of habitat. Restrictions on land use and recommendations outlined in these documents were used while planning the B2H Project, particularly regarding biological resources. A summary of all federally imposed seasonal restrictions is available in the project record; the B2H Project would comply with all agency timing restrictions unless an exception is granted by the agencies.

Forest and Rangeland Renewable Resources Planning Act

The Forest and Rangeland Renewable Resources Planning Act (FRRRPA), as amended by the NFMA consolidates and articulates USFS management responsibilities similar to those described under the NFMA. The FRRRPA requires the assessment, planning, and monitoring of national forest resources with periodic display to Congress facilitating the direction of goods and services to be produced from the nation's forests.

Special Status Species

Special status species include the following: (1) species listed under the ESA as endangered, threatened, proposed, or candidate; (2) BLM and USFS sensitive species; and (3) Oregon-listed threatened, endangered, vulnerable, or critical species. Due to their high-priority status, ESA species also will be discussed and analyzed separately in this document. Both the USFS and the BLM have established lists of species they consider "at risk" on lands they manage: the USFS Regional Forester's sensitive species list and the BLM State Directors' special status species list. The Regional Forester's sensitive species list includes animal species for which population viability is a concern within lands managed by the USFS. BLM special status species, per BLM Manual 6840 (BLM 2008), are managed under the special status species policy, whose purpose is to conserve listed species and their ecosystems and to ensure that actions taken by the BLM are consistent with the conservation of special status species and do not contribute to the listing of any species under the ESA.

U.S. Forest Service Management Indicator Species

USFS Manual 2620.5(1) defines MIS as "plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (USFS 1991). Each national forest designates its own list of MIS. The Wallowa-Whitman National Forest has five MIS or groups that could occur in the study corridor.

Wildlife Concerns for Tribes with Treaty Rights and Traditional Interests in the Study Corridor

As a majority of the B2H Project area is within lands ceded to the U.S. Government by the Treaty of 1855 with the Cayuse, Umatilla, and Walla Walla Tribes, the BLM and USFS—as managers of the federal lands within the B2H Project area—have the legal responsibility to consult with the CTUIR and consider the conditions necessary to satisfy the rights reserved by the tribe as part of the treaty. Exercise of treaty rights could include, but is not limited to, collection of plant resources and hunting of small and large game for economic, religious, and cultural use. B2H Project impacts on wildlife have the potential to affect the CTUIR's exercise of these treaty rights.

Although the CTUIR is the only Native American group with ceded lands in the B2H Project area, several other tribes maintain traditional interests in natural resources, including wildlife, within the B2H study corridor. As indicated in consultation with the BLM, the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation maintain that they possess "aboriginal title" to lands within the B2H Project area. The Burns Paiute Tribe, the Nez Perce Tribe, the Confederated Tribes of the Colville Reservation, and the Shoshone-Bannock Tribes of the Fort Hall Reservation consider portions of the B2H Project area to be part of their aboriginal territory, subsistence range, traditional use area, or zone of influence.

Over the past two centuries, tribal access to natural resources, including hunting, gathering and grazing, has been affected by changes to land ownership patterns, commercial extraction of resources, land use, and land-management practices. Nevertheless, Native American tribes maintain an active

interest in wildlife in the B2H Project area. The BLM currently is consulting with these Native American sovereign tribal governments to better understand the nature and location of wildlife impact concerns for the B2H Project. Ethnographic studies have been completed by the CTUIR and Shoshone-Paiute Tribes of the Duck Valley Indian Reservation; ethnographic studies currently are being conducted by the Burns Paiute Tribe and may reveal additional information regarding type and distribution of species of small and large game considered significant by the tribes.

STATE

Comprehensive Wildlife Conservation Strategies

The IDFG and ODFW have published comprehensive wildlife conservation strategies aimed at encouraging land-management activities that conserve and enhance wildlife habitat (IDFG 2011; ODFW 2006). These state comprehensive conservation strategies were established to create a conservation plan to conserve the states' species of greatest conservation need and to provide a common framework that would enable conservation partners (federal, state, and private) to jointly implement a long-term approach for the benefit of those species. The conservation strategies (also known as conservation plans) are not regulatory documents, so they are not intended to be prescriptive, and the species identified are not equivalent to an official state listing as threatened, endangered, or fully protected. However, these conservation strategies do identify species of greatest conservation need, identify the key habitats for each species and the regions within the state where they can be found, recommend actions to improve the species' population status and habitat conditions, and describe an approach for long-term monitoring. In general, the species identified as species of greatest conservation need are those that have demonstrated a conservation need (due to population or habitat conditions) or where demographic data are lacking. Oregon's comprehensive wildlife conservation strategy lists 224 species of greatest conservation need, including 166 vertebrates and 58 invertebrates (ODFW 2006). The Idaho comprehensive wildlife conservation strategy establishes 229 species of greatest conservation need, including 126 vertebrate species and 103 invertebrate species (IDFG 2011). The IDFG is in the process of drafting a new state wildlife action plan that will supersede the comprehensive wildlife conservation strategies and may be released to the public in 2016.

Oregon Endangered Species Act

Oregon enacted a state ESA (ORS 496.171 to 496.192 and 498.026) in 1987. The goal of this state law is for conservation of threatened or endangered species through "the use of methods and procedures necessary to bring a species to the point at which [protective] measures are no longer necessary" (ORS 496.171[1]). Species on the Oregon state list include all native species listed under the Federal ESA as of May 15, 1987, as well as any additional native species determined by the appropriate state agency to be in danger of extinction throughout a large portion of the species' range within Oregon. The Oregon ESA requires state agencies to develop programs to manage and protect endangered species and to follow guidelines for threatened species. Responsibility for these species falls to the ODFW. Species can be Oregon state-listed as endangered or threatened, proposed as endangered or threatened, or proposed as a candidate for listing (ORBIC 2010). Oregon maintains a list of species protected under the Oregon ESA of 1987 (ORBIC 2010). The ODFW also maintains a list of sensitive species, under

which species can be designated as critical or vulnerable (ORBIC 2010). This list is used to determine species on which to focus management, research, and conservation activities. For projects subject to Energy Facility Siting Council (EFSC) standards, such as the B2H Project, the jurisdiction of the Oregon endangered species list extends to all lands in the state. In addition, enforcement and management of the state law is limited to state agencies (e.g., the ODA for listed plant species).

Oregon Habitat Mitigation Policy

The ODFW has developed a Fish and Wildlife Habitat Mitigation Policy (Oregon Administrative Rules [OAR] 635-415-0000) that provides a framework for assigning one of six category types to habitats based on the relative importance of these habitats to fish and wildlife species. The policy establishes consistent goals and standards to mitigate the impacts of a project on fish and wildlife habitats. A project's potential impact on Fish and Wildlife Habitat Mitigation Policy category types (as defined under OAR 635-415-0000) needs to be assessed as part of the project's EFSC site certification. The EFSC specifies the conditions of construction and operations required by Oregon. If approved, a Site Certification Agreement is issued in lieu of any other individual Oregon state or local agency permits (this assessment would be restricted to the portion of the B2H Project that crosses Oregon, as a similar program has not been developed in Idaho). This type of analysis is not included in the NEPA process and is instead disclosed in Exhibit P of the B2H Project's application for EFSC site certification. The habitat category types from the Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0025) are defined as follows:

- Category 1: Irreplaceable, essential, and limited habitat with a mitigation goal of no loss of habitat quantity or quality. The mitigation strategy is avoidance.
- Category 2: Essential and limited habitat with a mitigation goal of no net loss of habitat quantity or quality and to provide a net benefit of habitat quantity or quality. The mitigation strategy is in-kind, in-proximity mitigation.
- Category 3: Essential habitat, or important and limited habitat, with a mitigation goal of no net loss of either habitat quantity or quality. The mitigation strategy is in-kind, in-proximity mitigation.
- Category 4: Important habitat with a mitigation goal of no net loss in either existing habitat quantity or quality. The mitigation strategy is either in-kind or out-of-kind or in-proximity or off-proximity mitigation.
- Category 5: Habitat with a high potential to become either essential or important habitat with a mitigation goal, if impacts are unavoidable, to provide a net benefit in habitat quantity or quality. The mitigation strategy includes actions that improve habitat conditions.
- Category 6: Habitat with low potential to become essential or important habitat with a mitigation goal of minimizing impacts. The mitigation strategy is minimizing direct habitat loss and avoiding off-site impacts.

GREATER SAGE-GROUSE POLICY AND MANAGEMENT GUIDANCE

U.S. Fish and Wildlife Service 12-month Findings for Petitions to List the Greater Sage-Grouse as Threatened or Endangered

In 2010, the USFWS issued its *12-Month Findings for Petitions to List the Greater Sage-Grouse as Threatened or Endangered*, which found that listing the Greater Sage-Grouse as threatened or endangered under the ESA is warranted, but precluded by higher-priority listing actions (USFWS 2010a). The USFWS found that "sagebrush habitats are becoming increasingly degraded and fragmented due to multiple threats" and identified the major threats to Greater Sage-Grouse habitat as "direct conversion, urbanization, infrastructure such as roads and power lines built in support of several activities, wildfire and the change in wildfire frequency, incursion of invasive plants, grazing, and nonrenewable and renewable energy development." On October 2, 2015, the USFWS announced a 12-month finding on petitions to list the Greater Sage-Grouse, both range-wide and the Columbia Basin population, as an endangered or threatened species under the ESA of 1973, as amended (80 *Federal Register* 59857). After review of the best available scientific and commercial information, the USFWS found that the Columbia Basin population does not qualify as a distinct population segment and that listing the Greater Sage-Grouse was not warranted.

Greater Sage-Grouse Range-wide Mitigation Framework (Version 1.0 – September 3, 2014)

In September 2014, the USFWS issued its Greater Sage-Grouse Range-Wide Mitigation Framework. The first part of this document provides general goals and regulatory considerations for any mitigation program within the context of the mitigation hierarchy. The second part provides overarching mitigation principles, standards, and recommendations for the development of mitigation processes and programs. The purpose of this document is to communicate some of the factors that the USFWS is likely to consider in evaluating the efficacy of mitigation practices and programs in reducing threats to Greater Sage-Grouse. The recommendations provided in this framework are consistent with the information and conservation objectives provided in the 2013 Conservation Objectives Team (COT) Report for Greater Sage-Grouse.

Oregon Department of Fish and Wildlife Management Plans

The ODFW uses the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat (Conservation Assessment and Strategy) (ODFW 2011) to provide guidance to public and private land managers for Greater Sage-Grouse conservation. In September 2015, the ODFW Commission established OAR 635-140 for the Conservation Assessment and Strategy for the protection and enhancement of Greater Sage-Grouse in Oregon. These administrative rules guide the ODFW's approach to evaluating mitigation measures following anthropogenic impacts on Greater Sage-Grouse and Greater Sage-Grouse habitat. OAR 635-140 describes the hierarchy for avoidance, minimization and mitigation measures for direct and indirect impacts.

The Conservation Assessment and Strategy uses a core area landscape approach, as developed by Doherty et al. (2010), to protect Greater Sage-Grouse habitats. This landscape approach prioritizes habitats based on measures that assess Greater Sage-Grouse population and habitat relative abundance and provides protection for a minimum of 75 percent of the population. This landscape approach establishes core areas and low-density areas based on metrics that assess Greater Sage-Grouse populations and habitat abundance. Core areas are established to protect the most important breeding areas, and this is determined from spring lek counts of males, while low-density habitat is delineated in additional areas that provide breeding, summer, and migratory habitats for Greater Sage-Grouse. According to the Conservation Assessment and Strategy, the goal of core areas is to "assist in identifying the most productive habitat areas for Greater Sage-Grouse and those areas that should be protected from habitat loss and fragmentation" (ODFW 2011). Because core areas are established around high densities of Greater Sage-Grouse, they protect about 90 percent of the population while only encompassing about 38 percent of the species' range within Oregon.

The ODFW classifies the status of Greater Sage-Grouse leks for management purposes, using the following definitions for documenting lek status in Oregon:

- Occupied lek: A regularly visited lek that has had at least one male counted in the last 7 years.
- Occupied pending: A lek not counted regularly in the last 7 years, but birds were present at last visit.
- Unoccupied lek: A lek that has been counted annually and has had zero birds for 8 or more consecutive years.
- Unoccupied pending: A lek not counted regularly in a 7-year period, but birds were not present at last visit.
- Unknown lek: Any lek where the status has not been documented during the course of a breeding season. New leks found during aerial surveys in the current year receive an annual status of unknown unless they are confirmed on the ground or observed more than one time by air.
- Historic lek: A lek that has been unoccupied prior to 1980 and remains so.

The ODFW, in coordination with the Sage-Grouse Conservation Partnership, developed a Greater Sage-Grouse Habitat Quantification Tool (HQT). The HQT is a science-based approach that measures the quantity and quality of Greater Sage-Grouse habitat at a site in terms of habitat function, measured in functional acres. Habitat function refers to the quality of the habitat for meeting life history requirements (reproduction, recruitment and survival) for Greater Sage-Grouse at multiple scales (site, local and landscape), and includes biotic and abiotic factors as well as the direct and indirect effects of anthropogenic disturbances on and surrounding the site. To determine functional acres, the HQT uses a geographic information system component that incorporates over 40 datasets that reflect important aspects of Greater Sage-Grouse ecology, landscape condition, land use, and management.

Oregon's approach to mitigation for impacts on Sage-Grouse and Sage-Grouse habitat, outlined in the state's Oregon Greater Sage-Grouse Action Plan (Sage-Grouse Conservation Partnership), uses the

HQT to determine debits generated by anthropogenic disturbances and credits generated by mitigation projects in functional acres. The HQT is currently being tested and refined by the Sage-Grouse Conservation Partnership to ensure it is a functional tool for public use.

Management of Greater Sage-Grouse in Idaho

In Idaho, management direction for Greater Sage-Grouse falls under the Conservation Plan for the Greater Sage-Grouse in Idaho as amended by the Idaho Sage-Grouse Task Force (2012). The conservation plan includes background information on Greater Sage-Grouse, a summary of the species' status in Idaho, a discussion of threats, various types of conservation measures, and evaluation guidelines and recommendations for research and monitoring. This plan refers to local working group plans for more specific direction, which in the vicinity of the B2H Project area includes the Owyhee County Sage-grouse Management Plan. "The purpose of the Owyhee County Sage-grouse Management Plan is to use local input and knowledge to develop a long-term collaborative management plan providing a framework for Greater Sage-Grouse management in conjunction with federal, state, and Owyhee County land management plans and actions in Owyhee County. This long-term management plan will provide guidance to resource and land management agencies as well as Owyhee County in dealing with issues that directly or indirectly affect the Goal of the local working group."

The IDFG classifies the status of Greater Sage-Grouse leks for management purposes using the following definitions for lek status in Idaho:

- Occupied lek: A lek that has been active (i.e., at least two displaying males observed) during at least one breeding season within the prior 5 years.
- Unoccupied lek: A lek that has not been active during a period of 5 consecutive years.
- Undetermined lek: Any lek that has not been documented as active in the last 5 years but for which survey information is insufficient to designate the lek as unoccupied. For example, if a lek is discovered the first time during an aerial survey but is not confirmed on the ground that year or revisited in subsequent years, the location is given an undetermined status.

Bureau of Land Management Policy for Greater Sage-Grouse

The BLM issued a Record of Decision approving the Greater Sage-Grouse Approved Resource Management Plan Amendments (ARMPAs) in September 2015, including the Oregon Greater Sage-Grouse ARMPA (BLM 2015a) and the Idaho and Southwestern Montana Greater Sage-Grouse ARMPA (BLM 2015b). The ARMPAs amended land-use plans in Idaho and Oregon by establishing Greater Sage-Grouse management areas and providing direction for management and conservation of Greater Sage-Grouse and its habitat. The ARMPAs were a critical component to ensure the protection of Greater Sage-Grouse habitat by avoiding, minimizing, and compensating for unavoidable impacts of threats on Greater Sage-Grouse habitat and helped support the U.S. Fish and Wildlife Service's determination that Greater Sage-Grouse no longer warrants protection under the Endangered Species Act.

In particular, these amendments changed land use designations for management decisions within newly delineated Greater Sage-Grouse Habitat Management Areas. Land-use designations for realty actions such as rights-of-way for high-voltage transmission lines within Priority Habitat Management Areas (PHMA) and General Habitat Management Areas (GHMA) in Oregon, and PHMA and Important Habitat Management Areas (IHMA) in Idaho have changed from "open" to "avoidance areas". While this new management prescription generally changes the areas available for actions like rights-of-way for high-voltage transmission lines, the BLM identified in the ARMPAs several priority transmission projects under review that would not be affected by the new management decisions. Instead, the management prescriptions for only these identified projects would remain "open" and not bound by the more limited designation of "avoidance."

The B2H Project was one of the priority transmission projects identified in the ARMPAs (refer to MD LR 6 in the BLM ARMPAs for Oregon, and MD LR 12 in the BLM ARMPAs for Idaho and Southwestern Montana, listed below). Specific language included in the BLM ARMPAs for Oregon applicable to the B2H Project includes:

> **MD LR 6:** Priority Habitat Management Areas (PHMA) and General Habitat Management Areas (GHMA) are designated as avoidance areas for high voltage (100-kV or greater) transmission lines and major pipelines (24" or greater in diameter) ROWs (including permits and leases). All authorizations in these areas, other than the following identified projects, shall comply with the conservation measures outlined in this Approved Plan, including the RDFs (Appendix C) and screening criteria (see SSS 13) of this document. The BLM is currently processing an application for Boardman to Hemingway Transmission Line Project and the NEPA review for this project is well underway. Conservation measures for GRSG are being analyzed through the project's NEPA review process, which should achieve a net conservation benefit for the GRSG.

Specific language included in the BLM ARMPAs in Idaho applicable to the B2H Project includes:

> **MD LR 12:** PHMA (Idaho and Montana) and IHMA (Idaho), and GHMA (Montana only) are designated as avoidance areas for high voltage transmission line and large pipeline ROWs, except for Gateway West and Boardman to Hemingway Transmission Projects. All authorizations in these areas, other than the following identified projects, must comply with the conservation measures outlined in this proposed plan, including the RDFs and avoidance criteria presented in MD SSS 29 and MD SSS 30 of this document. The BLM is currently processing an application for Gateway West and Boardman to Hemingway Transmission Projects and the NEPA review for this project is well underway. Conservation measures for GRSG are being analyzed through the project's NEPA review process, which should achieve a net conservation benefit for the GRSG.

The ARMPAs also acknowledged that the NEPA process for the B2H Project has been underway for several years and that the BLM is already assessing the impacts of the B2H Project to Greater Sage-Grouse and analyzing project-specific conservation measures through the B2H Project NEPA process.

While the conservation measures in the ARMPAs would not apply to the B2H Project, the Applicant has committed to comply with seasonal restrictions in the ARMPAs (refer to Appendix B) and to develop a comprehensive mitigation plan (based on the components outlined in the Framework Plan for Compensatory Mitigation, included in Appendix C), which will identify appropriate levels of compensatory mitigation to demonstrate a net conservation benefit. The Applicant, in coordination with the BLM and the cooperating agencies, will utilize the mitigation framework to guide the mitigation based on the final design and engineering of any selected route. The BLM will require the Applicant to complete a final Compensatory Mitigation Plan for Greater Sage-Grouse, prior to any surface-disturbing activity associated with construction of the transmission line being permitted and obtaining a Notice to Proceed. Compensatory mitigation will be in addition to project-specific conservation measures that the BLM and cooperating agencies have developed through the NEPA process to avoid and minimize effects on Greater Sage-Grouse and their habitats.

Through the ARMPAs, the BLM designated the habitat management areas as follows:

- PHMA: Land identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. PHMAs largely coincide with areas identified as Priority Areas of Conservation in the COT Report (described below). These areas include breeding, late brood-rearing, winter concentration areas, and migration or connectivity corridors.
- IHMA (Idaho and Southwestern Montana ARMPA only): Lands that contain additional habitat and populations that provide a management buffer for the PHMA and to connect patches of PHMA. IHMAs typically are adjacent to PHMAs but generally reflect somewhat lower Greater Sage-Grouse population status and/or reduced habitat value due to disturbance, habitat fragmentation, or other factors. Within the B2H Project area IHMAs are designated in Idaho but not Oregon.
- GHMA: Lands where some special management will apply to sustain Greater Sage-Grouse populations; areas of occupied seasonal or year-round habitat outside of PHMA and IHMA.

Western Association of Fish and Wildlife Agencies Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats

The Western Association of Fish and Wildlife Agencies (WAFWA) entered into a contract with the USFWS in 2002 to produce a complete conservation assessment for Greater Sage-Grouse and its habitat. The WAFWA chose to produce the assessment in two phases: the first phase is an assessment of Greater Sage-Grouse populations and sagebrush habitats on which they depend and referred to as the Western Association of Fish and Wildlife Agencies Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats (WAFWA Assessment) (Connelly et al. 2004); the second phase is discussed below. The WAFWA Assessment provides a thorough discussion of population status and trends, population ecology and characteristics, habitat characteristics, sagebrush ecosystem dynamics, sagebrush ecosystem status and trends, and other information concerning impacts on Greater Sage-Grouse. The WAFWA Assessment demonstrated that approximately 99 percent of the current population of Greater Sage-Grouse is found in the U.S., while the remaining 1 percent is located in Canada. Federal lands make up about 72 percent of the total range of the species, which makes federal

land-managing agencies primarily responsible for habitat management. However, privately owned lands provide critical seasonal habitats for many populations and their importance to conservation may greatly exceed their ownership percentage. Throughout their range, Greater Sage-Grouse populations are located on lands that overlap significant natural resources, such as oil and gas resources, water resources, wind power sites, mineral deposits, agricultural, and recreational areas. Greater Sage-Grouse also are found in habitats that are at significant risk of change due to exotic weeds, fire, and conifer encroachment.

WAFWA Greater Sage-Grouse Comprehensive Conservation

This document, identified as the WAFWA Greater Sage-Grouse Comprehensive Conservation Strategy (WAFWA Strategy) (Stiver at al. 2006), is the second phase of the WAFWA Assessment discussed above. The WAFWA Strategy is a conservation strategy for Greater Sage- Grouse and sagebrush habitats and is designed to augment and facilitate other conservation plans and strategies. This document references local, state, provincial, and agency conservation strategies and adds regional and range-wide strategies. Seven substrategies are outlined in the WAFWA Strategy, including: (1) conservation actions, (2) monitoring the effectiveness of conservation actions, (3) monitoring the implementation of conservation actions, (4) research and technology, (5) funding, (6) communications, and (7) adaptive management. In this WAFWA Strategy, seven Greater Sage-Grouse management zones are established based on populations within floristic provinces. The success of conservation actions will be judged on the basis of long-term population trends in each of the seven management zones. The overall goal of the WAFWA Strategy is to maintain and enhance populations and distribution of Greater Sage-Grouse by protecting and improving sagebrush habitats and ecosystems that sustain these populations. The overall objective of the WAFWA Strategy is to produce and maintain neutral or positive trends in populations and to maintain or increase the distribution of Greater Sage-Grouse in each management zone.

Bureau of Land Management National Technical Team Report

As part of its Greater Sage-Grouse conservation efforts, the BLM convened a National Technical Team. This team was composed of representatives from the BLM, the USFWS, the NRCS, the USGS, and state fish and wildlife agencies. The team was responsible for (1) ensuring that relevant science for Greater Sage-Grouse conservation was considered, reasonably interpreted, and accurately presented with risks and uncertainties clearly delineated; (2) providing conservation objectives in measurable terms to guide planning; and (3) identifying science-based conservation measures. By the end of 2011, the National Technical Team prepared a report that fulfilled this responsibility (released as IM 2012-044). The National Technical Team report provides management recommendations for the species across its entire range that could be implemented to address the threats. Because the range of the species is so large, and local ecological conditions vary, it is possible that local management decisions may differ from the specific standards in the report. If the local plan decisions vary from the National Technical Team report, the differences will be justified by scientific or local information. The report and its associated conservation measures are not intended to create a standard for Greater Sage-Grouse management.

U.S. Fish and Wildlife Service Conservation Objectives Team Report

Working in advance of its 2015 listing decision, the USFWS decided to develop conservation objectives for the Greater Sage-Grouse that could help direct conservation actions for the species. The USFWS created a COT Report of state experts and USFWS representatives to accomplish this task. The team developed *Greater Sage-grouse Conservation Objectives: Final COT Report*, which identifies key areas for Greater Sage-Grouse and key threats in those areas, as well as the extent to which they need to be reduced in order for the species to be conserved and for the USFWS to determine that listing is not warranted (USFWS 2013). The COT Report establishes conservation objectives for the primary habitat threats identified in the March 2010 USFWS finding that listing of the Greater Sage-Grouse was warranted but precluded. Those objectives could be met through local planning efforts, BLM planning efforts, and state efforts. The highest level objective identified in the COT Report is identified as meeting the objectives of the 2006 WAFWA Greater Sage-Grouse Comprehensive Strategy of "reversing negative population trends and achieving a neutral or positive population trend." The COT Report identifies the threats to be addressed to meet overall conservation objectives. Additional information on the COT Report is provided on the USFWS website: http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/COT/COT-Report-with-Dear-Interested-Reader-Letter.pdf.

The USFWS will use the COT Report to review B2H actions and determine whether these actions will contribute toward the need to list the species under the Federal ESA. For new transmission lines and roads, the following COT Report criteria are important in the overall listing review: avoid Priority Area of Conservation (PAC) and other high-quality Greater Sage-Grouse habitat; minimize impacts on Greater Sage-Grouse and their habitat via actions such as undergrounding and narrow-separation colocation; assess all direct and indirect effects; assign value (mitigation ratios) based on habitat or population characteristics; apply good mitigation principles and standards when designing mitigation actions (refer to USFWS range-wide mitigation framework for additional guidance), and ensure the B2H Project (in its entirety) results in a net conservation benefit to Greater Sage-Grouse.

U.S. Geological Survey Baseline Environmental Report

To augment the BLM's planning on a biological and meaningful scale for Greater Sage-Grouse, a Baseline Environmental Report (BER) for Greater Sage-Grouse was produced by the USGS (Manier et al. 2013). The BER is a science support document that provides information to put planning units and issues into the context of the larger WAFWA Greater Sage-Grouse Management Zones. The BER examines each threat identified in the USFWS's listing decision published on March 15, 2010. For each threat, the BER summarizes the current, scientific understanding of various impacts on Greater Sage-Grouse populations and habitats. The BER also reports patterns, thresholds, indicators, metrics, and measured responses that quantify the impacts of each specific threat. Additional information on the BER is provided on the USGS website: http://pubs.usgs.gov/of/2013/1098/.

Greater Sage-Grouse Ecology and Conservation of a Landscape Species and its Habitats (Greater Sage-Grouse Monograph)

Thirty-eight federal, state, university, and nongovernmental experts collaborated to produce new scientific information about Greater Sage-Grouse populations, sagebrush habitats, and relationships among Greater Sage-Grouse, sagebrush habitats, and land use. The information was published as a scientific monograph in the series *Studies in Avian Biology* under the management of the Cooper Ornithological Society (Knick and Connelly 2011). The Greater Sage-Grouse Monograph is an important foundation for developing conservation strategies and actions and provides a comprehensive synthesis of scientific information on the biology and ecology of the Greater Sage-Grouse.

3.2.4.3 Issues Identified for Analysis

The following wildlife-related issues were raised by the public, Native American tribes, or federal and state agencies during scoping or are issues that must be considered as required by law or regulation. The following statements summarize the issues identified that are associated with wildlife.

- What effects on wildlife habitats, such as fragmentation, fire regimes, and spread or introduction of invasive species, would occur?
- What would the effects on rare and/or sensitive wildlife habitats, such as caves, lava tubes, riparian areas, and aquatic habitats, be?
- What effects would there be on sensitive seasonal wildlife habitat, such as big game wintering or birthing areas and migration routes?
- What would be the effects on species with no special status, including birds, small mammals, reptiles, and amphibians?
- Would any of the habitats affected meet the definition of one of the six ODFW habitat categories, as described in the ODFW Habitat Mitigation Policy (OAR 635-415-00)? If so, how?
- Would big game species and designated big game areas be affected?
- Would the B2H Project have adverse effects on sensitive insects, such as bees?
- Would the B2H Project adversely affect raptor nests?
- What would be the effects on special wildlife areas, such as WMAs?
- Would the Oregon Conservation Strategy be implemented in B2H Project planning, construction, and operation?
- Would the B2H Project cause an increase in bird and bat electrocutions and collisions with towers, wires, and other structures?
- What would be the B2H Project effects on migratory birds?
- What would be the B2H Project effects on species considered of religious, cultural, or economic value to Native American tribes?
- Will the B2H Project result in fragmentation of key wildlife habitat?
- Would the B2H Project comply with the ODFW habitat categories, as described in the ODFW Habitat Mitigation Policy (OAR 635-415-00)?
- Would the B2H Project affect threatened, endangered, proposed, or sensitive wildlife species?
- Would the B2H Project disturb Greater Sage-Grouse habitat?

- Would waterfowl and shorebird migration routes be affected?
- Would the transmission line injure or kill birds that perch on or strike the lines?
- Would bats and their migratory corridors be affected by the transmission line?
- Would the transmission line affect elk, pronghorn, deer, or bighorn sheep?
- What would be the effects on bald and golden eagles?
- Would the B2H Project negatively affect special status wildlife species?
- Would federal critical habitat be affected?
- Would the B2H Project negatively affect Greater Sage-Grouse and their habitat and cause an increase in predation?
- What would the effects of ground disturbance be on pygmy rabbits or the Washington ground squirrel?

3.2.4.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 2.5.1 and 3.1.3. This section discusses how the study methods are applied to assess the impacts of the B2H Project on wildlife resources.

DATA SOURCES

The list of special status wildlife species that may occur in the B2H Project area was derived by identifying the federally listed endangered, threatened, and candidate species that occur in Oregon and Idaho; the species listed as endangered, threatened, and sensitive by Oregon; the Idaho species of greatest conservation need; the USFS sensitive species that occur on the Wallowa-Whitman National Forest; and BLM sensitive species that occur in Oregon and Idaho. This list was refined to include only species that have ranges in the vicinity of the study corridor; the list then was refined further to identify those species known to occur in the study corridor.

Information obtained from the following sources was used to evaluate wildlife resources within the study corridor:

- USFWS IPaC—Information for Planning, and Conservation
- IDFG State Wildlife Action Plan – Owyhee Uplands Section (Draft)
- IFWIS
- ORBIC database (ORBIC, formerly the Oregon Natural Heritage Information Center, maintains a database of occurrence records for sensitive species in Oregon; this database represents voluntarily documented and submitted records rather than records derived through systematic survey. Therefore, the absence of a record does not necessarily indicate that the species is not present. [Note: ORBIC requested that these rare-species occurrence locations be kept confidential.])
- ODFW Oregon Conservation Strategy
- Consultation with appropriate agencies
- USFS Regional Forester's sensitive species list (July 21, 2015)

- BLM State Directors' special status species lists (Oregon–July 13, 2015; Idaho—January 13, 2015)
- Peer-reviewed literature
- NatureServe web application

Data sources for GIS analyses included the following:

BLM Idaho and Oregon

- Greater Sage-Grouse PHMA, IHMA, and GHMA

BLM GeoBOB Database

- Wildsite data (pronghorn winter range in Oregon)
- Location data for various special status species

IDFG

- Bighorn sheep core herd home ranges
- Bighorn sheep population management units
- Bighorn sheep lambing areas
- Greater Sage-Grouse lek locations
- Mule deer winter range
- Pronghorn winter range
- IFWIS location data for various special status species

ODFW

- Bighorn sheep occupied habitat
- Elk winter range
- Greater Sage-Grouse lek locations (leks used in the analysis included those with a status of occupied, occupied pending, and unoccupied pending)
- Mule deer winter range

TetraTech, Inc. (Idaho and/or Oregon)

- Greater Sage-Grouse lek locations identified during B2H Project-specific surveys
- Washington ground squirrel colonies identified during B2H Project-specific surveys
- Raptor nests and individuals identified during B2H Project-specific surveys
- Other special status species identified during B2H Project-specific surveys

USFS

- The Wallowa-Whitman National Forest conducted an analysis of MIS using USFS GIS data and provided a report with information to be included in this EIS
- National Resource Information System (NRIS) location data for USFS sensitive species on the Wallowa-Whitman National Forest

USFWS

- Columbia spotted frog locations
- Golden eagle nest locations

Washington Department of Fish and Wildlife

- Location data for various special status species

Washington Wildlife Habitat Connectivity Working Group

- Washington ground squirrel habitat concentration areas

ANALYSIS AREA

The study corridor for wildlife habitat consisted of a 1-mile-wide corridor aligned with the alternative routes (0.5 mile on either side of the alternative route centerlines). This area was chosen because it was considered to be large enough to capture the extent of potential direct impacts on habitat that could occur during construction and operation of the B2H Project. For some species, where species-specific surveys were conducted (e.g., Washington ground squirrel), the analysis included a "site boundary,"' which included a 500-foot-wide corridor, including the transmission line, substation footprints, tensioning sites, multi-use areas, and access roads.

A 10-mile-wide corridor (5 miles on either side of the centerline and alternative centerlines) was used for identification of special status species that potentially could be affected by the B2H Project. This larger study corridor was chosen to account for the potential uncertainty of the presence (limited survey coverage) and locations (inaccurate or historical mapping techniques) of many special status species populations in the vicinity of the B2H Project area. Any species with known occurrences within the 10-mile-wide study corridor were considered to be present within the appropriate vegetation community subtype(s) that potentially could be affected by the B2H Project.

In an effort to effectively organize the overall analysis, the entire study corridor was divided into six B2H Project segments. These segments are mentioned throughout Section 3.2.4.5 and are analyzed in more detail for specific wildlife groups and species in Section 3.2.4.6.

The watershed level (i.e., the fifth level HUC) is used as the study corridor to assess impacts on USFS MIS and for activities on USFS lands.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Table 3-139 presents the criteria that were developed to assess the intensity of potential effects on wildlife species associated with implementation of the B2H Project. These criteria were based on considerations of relative abundance of each habitat type; consideration of a species legal status, regulatory protection, and susceptibility to temporary or permanent disturbances. Criteria were developed for wildlife habitat, special status species, migratory birds, including raptors, and big game.

Table 3-139. Criteria for Assessing Level of Impacts on Wildlife

Level of Impacts	Description
High	• Mortality of federally endangered, threatened, proposed, or candidate species • Ongoing mortality of wildlife (other than federally endangered, threatened, proposed, or candidate species) due to direct interaction with the B2H Project that may result in population-level effects • Permanent loss or displacement from large portions of occupied habitats for federally endangered, threatened, proposed, or candidate species • Permanent loss or displacement of wildlife (other than federally endangered, threatened, proposed, or candidate species) from crucial habitat during sensitive periods that results in population-level effects
Moderate	• Impacts that would have adverse effects on wildlife species (other than federally endangered, threatened, proposed, or candidate species) that does not reduce population viability • Permanent loss or modification of unoccupied suitable habitat for federally endangered, threatened, proposed, or candidate species • Disturbance or displacement of federally endangered, threatened, proposed, or candidate species from habitat that would not severely limit the long-term sustainability of populations • Temporary disturbance or displacement to wildlife (other than federally endangered, threatened, proposed, or candidate species) from crucial habitats during a critical or sensitive period • Removal of or disturbance to nesting sites, or disruption of breeding and foraging behavior for bald and golden eagles
Low	• Impacts that would have minor adverse effects on wildlife species (other than federally endangered, threatened, proposed, or candidate species) that does not reduce population viability • Loss of habitat for wildlife (other than federally endangered, threatened, proposed, and candidate species) that does not result in population -level effects • Temporary disturbance or displacement of wildlife (other than federally endangered, threatened, proposed, and candidate species) from seasonal habitats that occurs outside sensitive periods • Impacts that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (e.g., indirect effects or impacts in areas of pre-existing disturbance)

The duration of effects on wildlife resources is described according to the following terms and definitions:

- Short term (temporary) – 5 years or less
- Long term – More than 5 years
- Permanent – Impacts that endure beyond the life of the B2H Project

Effects Analysis

Assessment of Initial Impacts

Initial impacts are those effects resulting from the implementation of the B2H Project, with consideration of the design features of the B2H Project for environmental protection. The design features of the B2H Project for environmental protection would be implemented to reduce initial impacts on wildlife resources. Initial impacts on wildlife resources were assigned using the criteria for assessing impacts identified in Table 3-139. A list and description of all design features of the B2H Project for environmental protection are provided in Table 2-7. The design features of the B2H Project for environmental protection relevant to wildlife resources are summarized below.

- ***Design Feature 2 (Environmental Training for All Personnel)***. Prior to construction, the CIC would instruct all personnel on the protection of ecological and natural resources, such as (a) federal and state laws regarding wildlife resources; (b) the importance of ecological and natural resources; (c) the purpose and necessity of protecting ecological and natural resources; and (d) reporting and procedures for stop work.
- ***Design Feature 4 (Preconstruction Surveys for Sensitive Species)***. Preconstruction surveys for special status species, threatened and endangered species, or other species of particular concern would be considered in accordance with the Biological Resources Conservation Plan in the POD. In cases for which such species are identified, appropriate action would be taken to avoid adverse impacts on the species and its habitat. This design feature would minimize effects on the species and its habitat.
- ***Design Feature 5 (Spatial Extent of Construction Activities)***. The spatial limits of construction activities, including vehicle movement, would be predetermined with activity restricted to and confined within those limits.
- ***Design Feature 6 (Reclaim Construction Areas)***. In construction areas (e.g., staging areas, material laydown yards, fly yards, and wire pulling/splicing sites) where there is ground disturbance and where recontouring is required, surface reclamation would occur as required by the Reclamation, Revegetation, and Monitoring Plan or the landowner. The method of reclamation may consist of, but not be limited to, returning disturbed areas to their natural contour, reseeding, installing cross drains for erosion control, placing water bars in permanent roads, and filling ditches where they were installed for temporary roads.

  All areas on lands administered by federal agencies disturbed as a part of the construction and/or maintenance of the proposed transmission line would be seeded with a seed mixture appropriate for those areas as identified in the Reclamation, Revegetation, and Monitoring Plan Framework in the POD. The federal land-managing agency would approve a seed mixture that fits each range type. Seeding methods typically would include drill seeding, where practicable; however, the federal land-managing agency may recommend broadcast seeding as an alternative method in some cases.

  In construction areas where disturbing the existing contours is not required, vegetation would be left in place wherever possible, and original contours would be maintained to avoid excessive

root damage and allow for resprouting in accordance with the Reclamation, Revegetation, and Monitoring Plan or landowner approval.

- ***Design Feature 8 (Overland Travel in Construction Work Areas)***. Grading would be minimized by driving overland in areas approved in advance by the land-managing agency or land owner, or both, in predesignated work areas (e.g., staging areas, material laydown yards, fly yards, and wire pulling/splicing sites) whenever possible.
- ***Design Feature 9 (Use of Access Routes Outside of Right-of-Way)***. All vehicle movement outside the right-of-way would be restricted to predesignated access, contractor-acquired access, public roads, or overland travel routes approved in advance by the applicable land-managing agency or landowner.
- ***Design Feature 11 (Limit Construction and Maintenance Activities during Migratory Bird Nesting Season)***. On federal lands, avoid vegetation clearing and other construction and maintenance activities when possible during the migratory bird nesting season, between April 1 and July 15. On non-federal lands, B2H Project activities will be compliant with the MBTA.
- ***Design Feature 12 (Avian-Safe Design)***. The Applicant would design and construct all new or rebuilt transmission facilities to avian-safe design standards, including the Applicant's Avian Protection Plan (Idaho Power Company 2015), Reducing Avian Collisions with Power Lines (APLIC 2012) and Suggested Practices for Avian Protection on Power Lines (APLIC 2006).
- ***Design Feature 13 (Raptor Protection during Breeding)***. Agency guidelines for raptor protection during the breeding season would be followed.
- ***Design Feature 15 (Reduce Impacts on Riparian Areas)***. Consistent with the BLM and USFS riparian management policies, surface-disturbing activities would be avoided in defined segments of RCAs, using the following delineation criteria, unless exception criteria defined by the BLM are met or with agency approval of acceptable measures to protect riparian resources and habitats by avoiding or minimizing stormwater runoff, sedimentation, and disturbance of riparian vegetation, habitats, and wildlife species:
  - Fish-bearing streams: 300 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest.
  - Perennial non-fish-bearing streams: 150 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest.
  - Ponds, lakes, reservoirs, and wetlands greater than 1 acre: 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond, or lake, or to the extent of additional delineation criteria, whichever is greatest.
  - Intermittent or seasonally flowing streams and wetlands less than 1 acre: In watersheds that support ESA-listed fish species or designated critical habitat, or both, 100 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest. In watersheds that do not have current documented presence of ESA-listed fish species and /or designated critical habitat, 50 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest.

Mitigation measures, such as micro-siting road locations, would be developed on a site-specific basis, in consultation and coordination with the BLM and other federal land-managing agencies, and incorporated into the POD.

- ***Design Feature 16 (Span Riparian Communities/Water Courses)***. Based on biological resources surveys and results of Section 7 consultation, state and federally designated sensitive plants, habitat, wetlands, riparian areas, springs, wells, water courses, or rare/slow regenerating vegetation communities would be flagged and structures would be placed to allow spanning of these features, where feasible, within the limits of standard structure design.
- ***Design Feature 21 (Disposal of Hazardous Materials and Construction Waste)***. Hazardous material would not be discharged onto the ground or into streams or drainage areas. Enclosed containment would be provided for all waste. All construction waste (i.e., trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials) would be removed to a disposal facility authorized to accept such materials within one month of B2H Project completion, except for hazardous waste which would be removed within one week of B2H Project completion.

  Refueling and storing potentially hazardous materials would not occur within a 200-foot radius of all identified private water wells, and a 400-foot radius of all identified municipal or community water wells. Spill prevention and containment measures would be incorporated as needed.

Table 3-140 summarizes the level of anticipated initial impacts on wildlife resources, as well as the relevant design features of the B2H Project for environmental protection. Design features of the B2H Project for environmental protection that are identified for individual resources in Table 3-140 would also provide protection for other wildlife species that use the same habitat as those resources listed. The habitats used by the species listed in Table 3-140 are described in Section 3.2.4.5.

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection, selective mitigation measures would be applied where feasible to reduce potential impacts on wildlife resources or where required to comply with law, regulation, or agency policy. A list and description of all selective mitigation measures is provided in Table 2-13. The selective mitigation measures that would be applied to wildlife resources are summarized below.

- ***Selective Mitigation Measure 5 (Minimize Vegetation Clearing for Operational Clearances)***. Removal of vegetation in the right-of-way would be minimized to limit disturbance to timber resources and slow-growing vegetation communities and to protect sensitive habitat that is subject to structure- and conductor-clearance requirements. Trees and other vegetation would be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate.

Table 3-140. Summary of Initial and Residual Impact Levels for Wildlife Habitat Types

Common Name	Scientific Name	Habitat Type	Relevant Design Feature (location specific)	Initial Impact	Selective Mitigation Measure Applied (location specific)	Residual Impact
Special Status Wildlife						
Columbia spotted frog	*Rana luteiventris*	Suitable habitat (high potential)	2, 4, 5, 8, 9, 10, 15, 16, 21	Low	None	Low
		Occupied habitat	2, 4, 5, 8, 9, 10, 15, 16, 21	Moderate	2, 5, 6, 12	Moderate
		Potentially occupied habitat (higher quality)	2, 4, 5, 8, 9, 10, 15, 16, 21	Moderate	2, 5, 6, 12	Moderate
		Potentially occupied dispersal/connectivity habitat	2, 4, 5, 8, 9, 10, 15, 16, 21	Moderate	2, 5, 6, 12	Moderate
Greater Sage-Grouse	*Centrocercus urophasianus*	Priority Habitat Management Areas, Important Habitat Management Areas	2, 4, 5, 8, 9, 10, 12, 21	High	2, 6, 12, 14, 15	High
		General Habitat Management Areas	2, 4, 5, 8, 9, 10, 12, 21	Moderate	2, 6, 12, 14, 15	Moderate
Washington ground squirrel	*Urocitellus washingtoni*	Suitable habitat	2, 4, 5, 8, 9, 10, 21	Moderate	2, 6, 12, 14, 15	Moderate
		Occupied colony avoidance areas	2, 4, 5, 8, 9, 10, 21	High	2, 6, 8, 12, 14, 15	High
		Occupied colony dispersal areas	2, 4, 5, 8, 9, 10, 21	High	2, 6, 12, 14, 15	High
Big Game						
Elk	*Cervus canadensis*	Winter range	2, 5, 8, 9, 10, 21	Moderate	6, 12	Low
Mule deer	*Odocoileus hemionus*	Winter range	2, 5, 8, 9, 10, 21	Moderate	6, 12	Low
Pronghorn	*Antilocapra americana*	Winter range	2, 5, 8, 9, 10, 21	Moderate	6, 12	Low
Bighorn sheep	*Ovis canadensis*	Oregon occupied range	2, 5, 8, 9, 10, 21	Moderate	6, 12	Low
		Core herd home range	2, 5, 8, 9, 10, 21	Moderate	6, 12	Low
		Lambing areas	2, 5, 8, 9, 10, 21	High	6, 12	Low
		Population management units	2, 5, 8, 9, 10, 21	Low	None	Low

- ***Selective Mitigation Measure 6 (Limit New or Improved Accessibility to Areas Previously Inaccessible)***. In areas of sensitive habitat or areas sensitive to additional public access, new or improved access in the B2H Project area would be limited.

  New or improved access would be closed or rehabilitated using the most effective and least environmentally damaging methods appropriate to that area (in consultation with the landowner or land-managing agency). Methods for road closure or management may include installing locking gates, obstructing the path (e.g., earthen berms, boulders, redistribution of woody debris), revegetating and mulching the surface of the roadbed to make it less apparent, or restoring the road to its natural contour and vegetation.
- ***Selective Mitigation Measure 8 (Span or Avoid Sensitive Features)***. Within the limits of standard tower design, structures would be located to allow conductors to avoid identified sensitive features, such as sensitive wildlife and habitats. This could be accomplished through methods such as selective tower placement, spanning sensitive features, or realigning the B2H Project centerline (micro-siting).
- ***Selective Mitigation Measure 12 (Seasonal and Spatial Wildlife Restrictions)***. To minimize disturbance to identified wildlife species during sensitive periods, construction, operation, and maintenance activities on federals lands would be restricted in designated areas unless exceptions are granted by the Authorized Officer or his/her designated representative and other applicable regulatory agencies (e.g., USFWS, state wildlife agencies). Refer to Appendix B.
- ***Selective Mitigation Measure 14 (Overland Access)***. In addition to using overland travel in work areas, overland access to work areas may be used to reduce resource impacts. The construction contractor would use overland access to the greatest extent possible in areas where no grading would be needed to access work areas. Overland access would consist of drive-and-crush (i.e., vehicular travel to access a site without significantly modifying the landscape, cropping vegetation, or removing soil) and/or clear-and-cut travel (removal of all vegetation while leaving the root crown intact to improve or provide suitable access for equipment). Prior to commencement of work activities, overland access routes would be staked. Routes would be specified in the POD. Use of overland access routes would be restricted based on dry or frozen soil conditions, seasonal weather conditions, and relatively flat terrain.
- ***Selective Mitigation Measure 15 (Flight Diverters and Perch Deterrents)***. Shield wires, guy wires, and overhead optical ground wire along designated portions of the transmission line with a high potential for avian collisions would be marked with flight diverters or other BLM or USFS approved devices in accordance with agency requirements and Reducing Avian Collisions with Power Lines, The State of the Art in 2012 (APLIC 2012). Portions of the transmission line adjacent to or that cross through waterfowl and general migratory pathways or habitat for high-priority species may be marked to reduce the risk of avian collisions. This measure also may include use of devices to deter raptors from perching on transmission line structures in habitat for high-priority prey species (e.g., sage-grouse). The specific segments where these devices would be used would be determined in consultation with the appropriate agencies.

Assessment of Residual Impacts

Residual impacts include those impacts on wildlife resources that are anticipated after the application of selective mitigation measures. The level of potential residual impacts on special status wildlife resources associated with implementation of the B2H Project was assessed using the criteria presented in Table 3-139. Application of selective mitigation measures is expected to reduce the level of anticipated impacts. The summary of residual effects is provided in Table 3-140. Additional protection measures are outlined in the Operation and Maintenance Plan and the POD. Residual effects on wildlife habitat are the same as residual effects on the primary vegetation communities discussed in Section 3.2.3 and are not discussed here. Residual effects from the B2H Project are presented and discussed under Environmental Consequences for each segment. Habitats analyzed for Washington ground squirrel, Greater Sage-Grouse, and Columbia spotted frog are described below.

Additional Analysis

The extent of loss of wildlife habitat (in acres) due to B2H Project features was estimated to present a more explicit measure of impacts on wildlife resources and is presented for wildlife resources for all alternative routes and variations in Section 3.2.4.6. The total extent of disturbance (in acres) due to construction of features such as roads, transmission line towers, and other B2H Project facilities was estimated over the entire length of an alternative route based on the access model developed for the B2H Project and the Applicant's project description (refer to Section 2.5.1). Disturbance associated with construction of the B2H Project was assumed to occur at a constant density (acres) per mile and was calculated for each alternative route based on the total estimated disturbance and total length of each alternative route. The estimated density of disturbance (in acres per mile) for each alternative route was used to calculate the extent of effects on wildlife habitat (in acres) that could occur for each length of habitat crossed. As the estimated density of disturbance per mile in the alternative route study corridors varies by alternative route, the centerline of the alternative routes that cross the same length of wildlife habitat may vary in estimated area of disturbance (in acres) to the habitat.

To further evaluate the B2H Project's potential effects on Greater Sage-Grouse and bald and golden eagles, the number of leks (for Greater Sage-Grouse) and nests (for bald and golden eagles), were determined within set distances from the alternative routes centerline. The number of Greater Sage-Grouse leks was calculated within 0.25, 2.0, and 3.1 miles of centerlines and the number of gold and bald eagle nest was calculated within 0.5 and 5 miles of alternative route centerlines.

Indirect effects on Washington ground squirrel and Greater Sage-Grouse were quantified as the percentage of acres within a set distance from alternative routes centerline. Percentage of Washington ground squirrel habitat was calculated within the right-of-way (125 feet on each side of the alternative routes centerline) and percentage of Greater Sage-Grouse habitat was calculated within 3.1 miles of alternative routes centerline.

The buffer distances for Washington ground squirrel and bald and golden eagles were determined in coordination with the cooperating land-managing agencies. Buffer distances for Greater Sage-Grouse are based on findings on disturbance buffers from tall structures by Manier et al. (2014) and are

consistent with Appendix B – Lek Buffer Distances in the Oregon Greater Sage-Grouse ARMPA (BLM 2015a).

3.2.4.5 AFFECTED ENVIRONMENT

WILDLIFE HABITAT

The study corridor traverses four ecoregions: Columbia Plateau, Blue Mountains, Northern Basin and Range, and Snake River Plain. Descriptions of each of the four ecoregions in which the B2H Project occurs are provided in Section 3.2.3. Primary vegetation communities are described in detail in Section 3.2.3 and these community types are equivalent to the wildlife habitat types discussed in this section.

Wildlife species use a variety of habitats in the study corridor. These habitats provide important features such as foraging areas, breeding and wintering range, and cover for a range of bird, mammal, amphibian, reptile, and fish species common to eastern Oregon and southwestern Idaho.

The existing wildlife habitats in the study corridor are generally categorized as grassland, shrubland, forest/woodland, RCAs (includes wetlands, riparian, and surface water habitats, refer to Section 3.2.3), bare ground/cliff/talus, agriculture, and developed/disturbed areas. Although in smaller percentages than predominant habitat types within the study corridor, RCAs typically support the highest diversity of wildlife species. Wildlife habitat in the study corridor correspond to the vegetation community types discussed in Section 3.2.3. Each of these types exhibit existing fragmentation from land uses, such as roadway development, utility rights-of-way, agricultural use, livestock grazing practices, and wildfire. However, large blocks of contiguous habitat do occur throughout the study corridor. Wildlife populations in the vicinity of existing infrastructure (i.e., utility rights-of-way and roadway facilities and corridors) are likely to have already experienced some impacts associated with habitat fragmentation and disturbance such as reduced carrying capacity, lower reproductive success, higher susceptibility to predation, and reduced mobility and restricted home ranges. Table E-2 (Appendix E) lists some of the typical wildlife species expected to occur within each wildlife habitat type.

FEDERALLY PROPOSED, ENDANGERED, THREATENED, AND CANDIDATE SPECIES

Table 3-141 identifies the federally proposed, endangered, threatened, and candidate wildlife species with potential habitat or occurrences within the study corridor. There is no designated or proposed critical habitat for threatened or endangered wildlife species in the study corridor. Of the species listed in Table 3-141, only gray wolf was carried forward for analysis. The rationale for not carrying forward yellow-billed cuckoo, North American wolverine, Canada lynx, and Snake River physa snail for analysis is provided below.

Table 3-141. Federally Proposed, Endangered, Threatened and Candidate Wildlife Species with Potential Occurrence in the Study Corridor (by analysis segment)

Species	Status	Primary Wildlife Habitat Type (Source Habitat)	Occurrence In Study Corridor	Occurrence Potential by Segment					
				1	2	3	4	5	6
Birds									
Yellow-billed Cuckoo (*Coccyzus americanus*), Population: Western U.S. DPS	T	Wetland/Riparian/ Open Water (Riparian)	HN/N	N	N	N	N	N	N
Mammals									
North American Wolverine (*Gulo gulo luscus*)[1]	P	Forest/Woodland (Subalpine/ Montane Forest)	HD/S (dispersal only)	N	M	M	N	N	N
Canada lynx (*Lynx canadensis*)	T	Forest/Woodland (Subalpine/ Montane Forest)	HN/N	N	N	N	N	N	N
Gray Wolf (*Canis lupus*) Population: Rocky Mountain DPS	DL (east of US 395 in B2H Project area in Oregon), E (west of US 395 in B2H Project area in Oregon)	All habitats (habitat generalist)	HD/D	K	K	M	M	M	M
Invertebrates									
Snake River physa snail (*Physa natricina*)	E	Wetland/Riparian/ Open Water (Riparian)	HN/N	N	N	N	N	N	N

Table Source: Official U.S. Fish and Wildlife Species list for the Boardman to Hemingway Transmission Line Project (March 2016).

Table Notes:

[1]On April 4, 2016, wolverines in the contiguous U.S. were once again proposed as a threatened species under the ESA. The USFWS had not yet updated the ESA species list for the B2H Project area to include wolverines at the time that the official ESA species list for the B2H Project was received. However, portions of the B2H Project may be located in wolverine habitat.

DPS = Distinct population segment

Status Designations

C = Endangered Species Act (ESA) Candidate Species
P = Proposed Federally Threatened or Endangered
T = Federally Threatened
E = Federally Endangered
DL = Federally Delisted

Occurrence in Study Corridor

HD = Habitat documented or suspected within the study corridor or near enough to be affected by B2H Project activities
HN = Habitat not within the study corridor or affected by its activities
D = Species documented in general vicinity of B2H Project activities
S = Species suspected in general vicinity of B2H Project activities
N = Species not documented and not suspected in general vicinity of B2H Project activities

Occurrence Potential by Segment

K = Known to occur (documented within the study corridor)
L = Likely to occur (documented within B2H Project vicinity outside study corridor)
M = May occur (not documented in B2H Project vicinity but suitable habitat is present in study corridor and the B2H Project is within the species' range)
N = Does not occur

On October 3, 2014, the western distinct population segment of the yellow-billed cuckoo was formally listed as threatened. In accordance with the listing, critical habitat has been proposed but not designated. No proposed critical habitat has been identified in Oregon, and the nearest proposed critical habitat in Idaho is in the central portion of the state, well outside the boundaries of the study corridor. In addition, occupied or suitable habitat is not known to be present in the study corridor. This species is, therefore, not discussed in more detail.

On December 13, 2015, USFWS announced that wolverines in the contiguous U.S. are warranted to be listed under the ESA, but precluded from full protection due to other listings of higher priority, placing this distinct population segment of wolverines on the candidate list. On April 4, 2016, wolverines in the contiguous U.S. were once again proposed as a threatened species under the ESA. Although there is some peripheral/secondary habitat (dispersal) available in the study corridor for wolverine, there is no verified occurrence or source habitat. Individuals would likely only be found in the study corridor while dispersing among habitats. This species is, therefore, not discussed in more detail.

The distribution of the endangered Snake River physa snail is highly limited and only known within the Snake River in southern Idaho. The snail is not known to occur in the study corridor and is not discussed in more detail.

Due to the lack of source habitat and highly limited availability of secondary and dispersal ('peripheral') habitat, Canada lynx is not expected to occur within the study corridor. In addition, none of the Oregon counties listed as locations where lynx are known to or believed to occur are within the study corridor (USFWS 2016). This species is not discussed further.

Gray Wolf

Regulatory Status

The gray wolf has undergone a lengthy, complex history regarding its listing status under the ESA. Although this section does not present a full history of all listing actions and related court decisions, a summary is provided of the original listing history of the species and recent determinations that affect the listing status of the species in the B2H Project area.

The timber wolf, considered at the time an eastern subspecies of the gray wolf (*C. l. lycaon*), was listed under the Endangered Species Preservation Act in 1967 (32 *Federal Register* 4001). The northern Rocky Mountain wolf (*C. l. irremotus*) was listed under the Endangered Species Conservation Act in 1973 (U.S.C. Title 16, Sections 1531-1544), and the species was listed under the ESA in 1978 throughout the contiguous U.S., acknowledging that previous subspecies names and boundaries were likely inaccurate (43 *Federal Register* 9607-9615).

The USFWS designated the Northern Rocky Mountains population of gray wolves as a distinct population segment in 2008. USFWS delisted the distinct population segment after determining recovery objectives had been met (73 *Federal Register* 10514-10560). The gray wolf listing was reinstated in response to a court order in 2008 (73 *Federal Register* 75356-75371). In 2009, the USFWS published a rule delisting gray wolves in the Northern Rocky Mountains distinct populations

segment, except for Wyoming where the species remained listed as a nonessential experimental population (74 *Federal Register* 15123-15188). The delisted portion of the Northern Rocky Mountains distinct population segment was listed again in response to a court order in 2010 (75 *Federal Register* 65574-65579). In 2011, the Northern Rocky Mountains distinct population segment was delisted by legislation (76 *Federal Register* 25590-25592).

The Northern Rocky Mountains distinct population segment includes wolves in eastern Oregon and all of Idaho (as well as Montana, Wyoming, eastern Washington, and north-central Utah). In Oregon, wolves retain endangered status under the ESA in portions of the state west of the centerline of Highway 395 and Highway 78 north of Burns Junction, and west of the centerline of Highway 95 south of Burns Junction. Additionally, the gray wolf is listed as a sensitive species by the BLM in Idaho and Oregon and by the USFS on the Wallowa-Whitman National Forest.

Taxonomy and Life History

Taxonomy of North American wolves has been subject to frequent revision and contradiction, as indicated above in the history of the species' listing under the ESA, and uncertainty continues to this day. Although up to 24 New World and eight Old World subspecies have been described by some authors (Mech 1974, Wilson and Reeder 2005), many of these were considered invalid by later authors, and some have become extinct. As few as three or four subspecies may now be recognized in North America (78 *Federal Register* 60813-60815). One former subspecies is now recognized as the eastern (or timber) wolf (*C. lycaon*). The red wolf (*C. rufus*) of the southeastern U.S., listed as endangered under the ESA, is closely related to the eastern wolf, and both species appear to be more closely related to coyotes (*C. latrans*) than to the gray wolf (Wilson and Reeder 2005). One possible evolutionary and biogeographical explanation is that the common ancestor of the coyote, eastern wolf, and red wolf dispersed to and diverged in North America from the Eurasian gray wolf. These species later came into contact when gray wolves reached North America during a more recent interglacial period.

All North American wolf species are social and form packs of mostly related individuals led by a dominant male-female pair. Litter size averages six pups, which are raised in sheltered dens by the female. Gray wolves are mature at approximately one year, but may not reproduce until their second year. Gray wolves are almost exclusively carnivorous, cooperating to take large grazing mammals but also opportunistically capturing small mammals and birds (78 *Federal Register* 60813-60815), and even fish in some populations (Darimont and Reimchen 2002). Gray wolves will prey on livestock directly and also will scavenge on livestock carcasses (Morehouse and Boyce 2011).

Distribution and Habitat Requirements

The gray wolf is currently found south of Canada only in northern Mexico, a few areas in the Rocky Mountains (reintroduction sites in Montana, Wyoming, and Idaho), northwestern Great Lakes region, and Cascade Mountains of northern Washington. Formerly, gray wolves were much more numerous in the Rocky Mountain states than in the southwestern U.S. The gray wolf is a habitat generalist, with large stable home ranges and exclusive pack territories. Wolf packs generally consist of a breeding pair and offspring. Travel patterns across home ranges are influenced by elevation, topography, prey

distribution, and climatic conditions; travel routes along roads, trails, and survey lines for efficiency are common (Paquet and Carbyn 2003). In addition to avoiding roads and human activity, the gray wolf selects den sites (natal and secondary) according to proximity of stable food and water resources; selecting for proximity to ungulate prey species and often denning along ungulate migration routes. Den sites also are located relative to adjacent wolf pack proximity. However, territory overlap with other predators occurs. Limiting factors include climate, prey density, human-induced mortality and disease (Paquet and Carbyn 2003).

Threats to Survival

Human conflicts drive the primary threats to the ESA-listed population of the gray wolf, and human-caused deaths can be the majority of mortality for dispersing or resident wolves (Boyd and Pletscher 1999). Although wolves are generalists in their habitat and prey preferences to a degree, and tolerant of some human presence, the degree of disturbance, dispersal barriers, habitat modification, and conflicts with residents and livestock producers has rendered most of the lower and middle elevations within the range of the gray wolf unsuitable for their recovery. High road densities have been shown to increase gray wolf deaths from road mortality and shooting and decrease the probability of an area being occupied by gray wolves (Kaartinen et al. 2005). However, gray wolves also will travel opportunistically on low-use roads and trails that cross their home ranges (Whittington et al. 2005).

Occurrence in the Study Corridor

Gray wolves with federally endangered status are only found in Segment 1 of the study corridor, as described under Affected Environment for Segment 1. Gray wolves have federally endangered status in portions of the B2H Project west of U.S. 395. No known federally endangered wolf packs are crossed by the B2H Project, but estimated wolf use areas (as designated by ODFW) occur in the study corridor west of U.S. 395.

OTHER SPECIAL STATUS SPECIES

Table 3-142 presents animal species listed as sensitive by the BLM or USFS (threatened, endangered, critical, or vulnerable by Oregon or as species of greatest conservation need by Idaho) that potentially could occur in the study corridor. Three of these species, Columbia spotted frog (Great Basin distinct population segment), Greater Sage-Grouse, and Washington ground squirrel, are former candidates for protection under the ESA and are discussed in more detail below. The USFS sensitive species list includes animal species for which population viability is a concern on USFS-administered lands. USFS manages sensitive species under policy contained in USFS Manual 2670. The objective of the USFS policy is to maintain viable populations for native and desired non- native wildlife species in habitats distributed throughout their geographic range on USFS lands. BLM sensitive species are managed under the special status species policy contained in BLM Manual 6840 (BLM 2008). The objectives of the BLM special status species policy are to (1) conserve and/or recover ESA-listed species and the ecosystems on which they depend so ESA protections are no longer needed for these species and (2) to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species and minimize the likelihood of and the need for listing these species under the ESA. The B2H Project extends northwest from southwest Idaho to northeast Oregon across mostly shrubland habitat types.

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Amphibians								
Columbia spotted frog *(Rana luteiventris)* Great Basin distinct population segment	ID BLM S, ID SGCN, OR BLM S, CR	RCA	N	N	N	M	K	M
Columbia spotted frog *(Rana luteiventris)* Population outside Great Basin distinct population segment	USFS S, CR	RCA	K	K	K	M	N	N
Northern leopard frog (*Lithobates pipiens*)	ID BLM S, ID SGCN, OR BLM S, CR,	RCA	M	M	M	K	K	K
Rocky Mountain tailed frog *(Ascaphus montanus)*	OR BLM S, USFS S, SV	RCA	N	M	K	N	N	—
Western toad *(Bufo boreas)* Northern Rocky Mountain population only	ID BLM S, ID SGCN, SV	RCA, Forest/Woodland	M	M	K	K	K	M
Woodhouse's toad (*Anaxyrus woodhousii*) (*Anaxyrus woodhousii woodhouse – Idaho)*	ID BLM S, ID SGCN, OR BLM S	RCA	M	M	M	M	M	M
Reptiles								
Common garter snake (*Thamnophis sirtalis*)	ID BLM S	RCA, Forest/ Woodland, Grassland	—	—	—	—	—	M
Longnose snake (*Rhinocheilus lecontei*)	ID BLM S	Bare Ground/Cliffs/ Talus, Shrubland	—	—	—	—	—	M
Mojave black-collared lizard (*Crotaphytus bicinctores*)	ID BLM S, ID SGCN	Bare Ground/Cliffs/ Talus, Shrubland	—	—	—	—	—	K
Painted turtle (*Chrysemys picta*)	OR BLM S	Open Water	K	K	K	N	N	N
Western ground snake (*Sonorasemiannulata*)	ID BLM S	Bare Ground/Cliffs/ Talus, Shrubland	—	—	—	—	—	K

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Birds								
American bittern (*Botaurus lentiginosus*)	ID SGCN	RCA	—	—	—	—	—	M
American peregrine falcon (*Falco peregrinus anatum*)	ID BLM S, OR BLM S, USFS S, SV	Bare Ground/Cliffs/ Talus, Forest/ Woodland, RCA, Developed/Disturbed	M	K	K	M	M	M
American three-toed woodpecker (*Picoides dorsalis*)	SV	Forest/Woodland	K	K	K	N	N	—
American white pelican *(Pelecanus erythrorhynchos)*	ID SGCN, OR BLM S, SV	RCA	K	M	K	K	K	K
Bald eagle *(Haliaeetus leucocephalus)*	ID BLM S, OR BLM S, USFS S, ST	Forest/Woodland, Developed/Disturbed	K	K	K	K	K	K
Black-backed woodpecker (*Picoides arcticus*)	SV	Forest/Woodland	M	K	K	M	M	—
Black-throated sparrow (*Amphispiza bilineata*)	ID BLM S	Shrubland	—	—	—	—	—	K
Black tern (*Chlidonias niger*)	ID SGCN	RCA	—	—	—	—	—	M
Bobolink (*Dolichonyx oryzivorus*)	OR BLM S, SV	Grassland, Shrubland	K	K	K	K	M	—
Brewer's sparrow (*Spizella breweri*)	ID BLM S	Shrubland	—	—	—	—	—	K
Burrowing owl (*Athene cunicularia*)	CR, ID BLM S, ID SGCN	Grassland, Shrubland	K	M	K	K	K	K
California gull (breeding population) (*Larus californicus*)	ID SGCN	RCA	—	—	—	—	—	M

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Caspian tern (*Hydroprogne caspia*)	ID SGCN	RCA	—	—	—	—	—	M
Cassin's finch (*Haemorhous cassinii*)	ID BLM S	Forest/Woodland (conifer forest)	—	—	—	—	—	M
Clark's grebe (*Aechmophorus clarkii*)	ID SGCN	RCA	—	—	—	—	—	M
Common nighthawk (*Chordeiles minor*)	SC, ID SGCN	Grassland, Shrubland, Forest/Woodland	K	K	K	K	K	K
Ferruginous hawk *(Buteo regalis)*	ID BLM S, ID SGCN, CR	RCA, Grassland, Bare Ground/Cliffs/Talus	K	K	K	K	K	K
Flammulated owl (*Otus flammeolus*)	SV	Forest/Woodland	N	K	M	N	N	N
Golden eagle (*Aquila chrysaetos*)	BGEPA, ID BLM S, ID SGCN	Shrubland, Bare Ground/Cliffs/Talus, Grassland	K	K	K	K	K	K
Grasshopper sparrow *(Ammodramus savannarum)*	ID BLM S, ID SGCN, OR BLM S, SV	Grassland	K	K	K	K	K	K
Great gray owl (*Strix nebulosa*)	SV	Forest/Woodland	K	K	M	N	N	—
Greater Sage-Grouse (*Centrocercus urophasianus*)	ID BLM S, ID SGCN, OR BLM S, USFS S, SV	Shrubland	N	K	K	K	K	K
Greater sandhill crane *(Grus canadensistabida)*	SV	RCA, Grassland, Agriculture	M	M	M	M	M	—
Harlequin duck (*Histrionicus histrionicus*)	USFS S, ID BLM	RCA	K	K	N	—	—	N

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Horned grebe *(Podiceps auritus)*	OR BLM S	RCA	M	M	M	M	M	—
Lewis's woodpecker (*Melanerpes lewis*)	ID BLM S, OR BLM S, USFS S, CR	Forest/Woodland, RCA	M	K	K	M	M	K
Loggerhead shrike *(Lanius ludovicianus)*	ID BLM S, SV	Shrubland, Forest/Woodland	K	K	K	K	K	K
Long-billed curlew (*Numenius americanus*)	ID BLM S, ID SGCN, SV	Grassland, RCA	K	K	K	K	K	K
Mountain quail (*Oreortyx pictus*)	ID BLM S, SV	Shrubland, Forest/Woodland	M	M	M	M	M	M
Northern Goshawk (*Accipiter gentilis*)	ID BLM S, SV	Forest/Woodland	K	K	K	M	M	K
Olive-sided flycatcher (*Contopus cooperi*)	ID BLM S, SV	Forest/Woodland	N	K	M	N	N	N
Pileated woodpecker (*Dryocopus pileatus*)	SV	Forest/Woodland, RCA	K	K	M	N	N	—
Prairie falcon (*Falco mexicanus*)	ID BLM S	Shrubland, Bare Ground/Cliffs/Talus, Grassland	—	—	—	—	—	K
Ring-billed gull (breeding population) (*Larus delawarensis*)	ID SGCN	RCA	—	—	—	—	—	M
Sage sparrow (*Amphispiza belli*)	ID BLM S, ID SGCN, CR	Shrubland	M	M	M	K	K	K
Sage thrasher (*Oreoscoptes montanus*)	ID BLM S, ID SGCN	Shrubland	—	—	—	—	—	K

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Sandhill crane (*Grus canadensis*)	ID SGCN	RCA	—	—	—	—	—	M
Short-eared owl (*Asio flammeus*)	ID BLM S, ID SGCN	Grassland, Shrubland	—	—	—	—	—	K
Snowy egret (*Egretta thula)*	OR BLM S, SV	RCA	N	N	N	K	M	M
Swainson's hawk (*Buteo swainsoni*)	SV	Grassland, Shrubland, Agriculture	K	K	K	K	K	—
Tricolored blackbird (*Agelaius tricolor*)	OR BLM S	Agriculture, RCA, Grassland, Shrubland	K	M	N	N	N	N
Upland sandpiper (*Bartramia longicauda*)	USFS S, CR	Grassland, Agriculture	N	M	M	N	N	—
Western grebe (*Aechmophorus occidentalis*)	ID SGCN	RCA	—	—	—	—	—	M
White-faced ibis (*Plegadis chihi*)	ID BLM S, ID SGCN	RCA, Shrublands	—	—	—	—	—	M
White-headed woodpecker (*Picoides albolarvatus*)	Idaho BLM S, OR BLM S, USFS S, CR	Forest/Woodland	N	M	K	N	N	N
Willow flycatcher *(Empidonax trailii)*	ID BLM S	RCA	—	—	—	—	—	M
Mammals								
American marten (*Martes americana*)	SV	Forest/Woodland	N	K	M	N	N	—
Bighorn sheep (*Ovis canadensis spp.*)	ID BLM S, ID SGCN	Bare Ground/Cliffs/ Talus, Shrubland	—	—	—	—	—	K

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Big brown bat (*Eptesicus fuscus*)	ID BLM S	Forest/Woodland, Agriculture	—	—	—	—	—	K
California myotis (*Myotis californicus)*	ID BLM S, SV	Forest/Woodland, RCA, Shrubland, Grassland	N	N	K	M	M	M
Canyon bat (*Perimyotis hesperus*)	ID BLM S	Bare Ground/Cliffs/Talus, Shrubland	—	—	—	—	—	K
Columbia plateau ground squirrel (*Spermophilus canus*)	ID SGCN	Sagebrush	—	—	—	—	—	M
Fringed myotis (*Myotis thysanodes*)	ID BLM S, OR BLM S, USFS S, SV	Shrubland, Grassland, Forest/Woodland	K	K	K	N	N	M
Gray wolf (*Canis lupus*)	USFWS DL (east of US 395 in B2H Project area in Oregon), USFWS E (west of US 395 in B2H Project area in Oregon), OR BLM S, ID BLM S, USFS S	Forest/Woodland (habitat generalist)	K	K	M	M	M	M
Hoary bat (*Lasiurus cinereus*)	ID SGCN	Shrubland, RCA	—	—	—	—	—	M
Little brown bat (*Myotis lucifugus*)	ID BLM S, ID SGCN	Forest/Woodland, RCA	—	—	—	—	—	K
Long-legged myotis (*Myotis volans*)	SV, ID BLM S	Forest/Woodland	N	K	K	N	N	N
Merriam's ground squirrel (*Spermophilus canus vigilis*)	ID BLM S	Shrubland	—	—	—	—	—	K
Pallid bat (*Antrozous pallidus*)	ID BLM S, OR BLM S, SV	Shrubland, Grassland, Bare Ground/Cliffs/ Talus	K	M	K	K	M	K
Piute ground squirrel (*Urocitellus mollis*)	ID BLM S	Shrubland, Grassland	—	—	—	—	—	K
Pygmy rabbit (*Brachylagus idahoensis*)	ID BLM S, ID SGCN, OR BLM S	Shrubland	N	N	M	M	K	M
Silver-haired bat (*Lasionycteris noctivagans*)	ID BLM S, ID SGCN, SV	Forest/Woodland	K	K	K	K	K	M

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Spotted bat (*Euderma maculatum*)	ID BLM S, OR BLM S, USFS S, SV	Shrublands, Bare Ground/Cliffs/Talus, Forest/Woodland	M	M	M	M	M	K
Townsend's big-eared bat (*Corynorhinus townsendii*)	ID BLM S, ID SGCN, OR BLM S, USFS S, CR	Shrublands, Forest/Woodland, Bare Ground/Cliffs/Talus	M	K	K	K	M	M
Washington ground squirrel (*Spermophilus washingtoni*)	OR BLM S, SE	Grassland, Shrubland	K	N	N	N	N	—
Western small-footed myotis (*Myotis ciliolabrum*)	ID BLM S, ID SGCN	Forest/Woodland, RCA, Shrubland, Grassland, Bare Ground/Cliffs/ Talus	—	—	—	—	—	K
White-tailed jackrabbit (*Lepus townsendii*)	SV	Shrubland, Grassland	M	K	K	M	K	—
Invertebrates								
Alpine tiger beetle (*Cicindela plutonica*)	ID SGCN	Shrubland	—	—	—	—	—	M
Blue mountainsnail (Oreohelix strigose delicata)	USFS S	Forest/Woodland	M	M	M	—	—	—
California floater (Anodonta californiensis)	USFS S	RCA	M	M	M	—	—	—
Columbia Oregonian (Cryptomastix hendersoni)	USFS S	RCA	M	M	M	—	—	—
Columbia pebblesnail (*Fluminicola fuscus*)	USFS S	RCA	M	M	M	—	—	—
Crooked Creek springsnail (*Pyrgulopsis intermedia*)	OR BLM S	RCA	N	N	N	N	M	—
Duckhead snowfly (*Capnura anas*)	ID SGCN	RCA	—	—	—	—	—	M
Fir pinwheel (*Radiodiscus abietum*)	USFS S	Forest/Woodland	N	M	N	—	—	—
Hunt's bumble bee (*Bombus huntii*)	ID SGCN	Shrubland	—	—	—	—	—	M
Intermountain sulphur *(Coliaschristina pseudochristina)*	OR BLM S, USFS S	Forest/Woodland	N	M	K	N	N	—

Table 3-142. Special Status Species with Documented Occurrence or Potential Habitat in the Study Corridor

Species	Status	Primary Wildlife Habitat Type	Occurrence Potential by Segment					
			1	2	3	4	5	6
Jackson Lake springsnail *(Pyrgulopsis robusta)*	OR BLM S	RCA	M	N	N	N	N	—
Johnson's hairstreak (*Callophrys johnsoni*)	USFS S	Forest/Woodland	M	K	K	—	—	—
Lined june beetle (*Polyphylla devestiva*)	ID SGCN	Shrubland, grassland	—	—	—	—	—	M
Morrison bumble bee (*Bombus morrisoni*)	ID SGCN	Shrubland	—	—	—	—	—	M
Owyhee springsnail *(Pyrgulopsis owyheensis)*	OR BLM S	RCA	N	N	N	N	K	—
Owyhee hot springsnail *(Pyrgulopsis fresti)*	OR BLM S	RCA	N	N	N	N	M	—
Poplar Oregonian (Cryptomastix populi)	OR BLM S, USFS S	RCA	N	M	N	N	N	—
Raptor fairy shrimp (*Branchinecta raptor*)	ID SGCN	RCA	—	—	—	—	—	M
Shortface lanx (*Fisherola nuttali*)	USFS S	RCA	M	M	M	—	—	—
Shiny tightcoil (Pristiloma wascoense)	USFS S	Forest/Woodland	M	M	M	—	—	—
Silver-bordered fritillary *(Boloria selene)*	OR BLM S, USFS S	RCA	N	M	M	N	N	—
Western bumblebee *(Bombus occidentalis)*	USFS S, OR BLM S	Grassland	K	K	K	M	M	—
Western ridged mussel (*Gonidea angulata*)	ID SGCN, OR BLM S, USFS S	RCA	K	M	M	M	M	M

Table Notes:
Dashes (—) indicate segments where the species is not categorized as a special status species (no determination of occupancy)

Status Designations
BGEPA = Bald and Golden Eagle Protection Act
CR = State Critical
ID BLM S = Idaho Bureau of Land Management Sensitive
ID SGCN = Idaho Species of Greatest Conservation Need
OR BLM S = Oregon Bureau of Land Management Sensitive
SC = State Candidate (Oregon)
SE = State Endangered (Oregon)
ST = State Threatened (Oregon)
SV = State Vulnerable (Oregon)
USFS S = U.S. Forest Service Sensitive
USFWS C = Candidate for listing under the Federal Endangered Species Act
USFWS DL = Delisted under the Federal Endangered Species Act
USFWS E = Endangered under the Federal Endangered Species Act
USFWS P = Proposed for listing under the Federal Endangered Species Act
USFWS T = Threatened under the Federal Endangered Species Act

Occurrence Potential by Segment
K = Known to occur (documented within the study corridor)
L = Likely to occur (documented within B2H Project vicinity outside study corridor)
M = May occur (not documented in B2H Project vicinity but suitable habitat is present in study corridor and the B2H Project is within the species' range)
N = Does not occur

This section describes the affected environment for special status wildlife species that are known to be present, or have suitable habitat, in the B2H Project area.

Table 3-142 identifies those special status wildlife species with documented occurrence or potential habitat in the study corridor, by analysis segment. For reference, MV-7 illustrates the broad distribution of vegetation communities (i.e., wildlife habitats) in the study corridor. Detailed discussions for special status species and their habitats are presented by segment.

Columbia Spotted Frog

Regulatory Status

In May 1989, the USFWS was petitioned to list the Columbia spotted frog under the ESA. In May 1993, the species was placed in a 12-month 'warranted but precluded from listing' status (58 *Federal Register* 27260, April 23, 1993).

The USFWS accepts species-specific genetic and geographic differences in Columbia spotted frogs based on Green et al. (1996 and 1997), and the populations are divided into four distinct population segments:

- Main (Northern) distinct population segment (Alaska, British Columbia, Alberta, Wyoming, Montana, north and central Idaho, eastern Washington, and northeastern Oregon)
- Great Basin distinct population segment (southwestern Idaho, northern Nevada, and eastern Oregon)
- Wasatch Front distinct population segment (Utah)
- West Desert distinct population segment (Utah)

All of the distinct population segments, except for the main population, were classified as candidate species by the USFWS's 12-month petition finding. The only population classified as a candidate species within the study corridor, the Great Basin distinct population segment, was determined to be not warranted for protection under the ESA on October 8, 2015 (80 *Federal Register* 60834). The Great Basin distinct population segment of the Columbia spotted frog is considered a BLM sensitive species in Idaho and Oregon, and is considered vulnerable by Oregon and a species of greatest conservation need by Idaho.

Taxonomy and Life History

Spotted frogs (*Rana pretiosa*) were first described as a single species and later split into two subspecies, *R. pretiosa pretiosa* and *R. pretiosa luteiventris*. More recently, work identifying species-specific genetic and geographic differences has resulted in characterization of populations in western Washington and Oregon and northeastern California as Oregon spotted frogs (*R. pretiosa*) and the remainder of the populations as Columbia spotted frogs (*R. luteiventris*). Based on further geographic and genetic characterization, Columbia spotted frogs in southwest Idaho, southeast Oregon, and northeast and central Nevada are part of the Great Basin population of Columbia spotted frogs. It was previously thought that populations in northeast Oregon were part of the Great Basin population;

however, it was later determined that these populations belong to the Northern or main population segment (USFWS 2011).

Distribution and Habitat Requirements

Prior to 1995, only six historical sites were known in the Owyhee Mountain range in Idaho and only 22 sites were known in southeastern Oregon in Malheur County. The current range of the Great Basin distinct population segments of Columbia spotted frog populations in Oregon and Idaho (Owyhee subpopulation) appear to be widely distributed throughout southwestern Idaho (Owyhee County) and southeastern Oregon (east of Highway 395 and south of Highway 20, including the Owyhee and Steens Mountains in Lake, Harney and Malheur Counties). Throughout their current range, many populations of Columbia spotted frog within the Great Basin distinct population segments are small and fragmented.

Columbia spotted frogs are closely associated with clear, slow-moving streams or ponded surface waters with permanent hydroperiods and relatively cool constant water temperatures (Arkle and Pilliod 2015). In addition to permanently wet habitat, streams with beaver ponds, deep maximum depth, abundant shoreline vegetation, and non-salmonid fish species have the greatest probability of being occupied by Columbia spotted frogs within the Great Basin (Arkle and Pilliod 2015). During the summer they may disperse into upland forests, grasslands, and shrublands; however, these upland habitats must still be closely associated with moist vegetated areas. Aquatic habitat for the spotted frog consists of the littoral zone of emergent vegetation, including willows (*Salix* spp.), grasses and sedges, and submerged aquatic plants. The Columbia spotted frog over-winters in or adjacent to perennial waterbodies that remain above freezing temperatures and are well oxygenated, such as streams, springs, and spring-fed lakes. Several studies have identified general associations between National Wetland Inventory classifications and Columbia spotted frog occurrences (Patla and Keinath 2005). The wetland classifications associated with source habitat for Columbia spotted frogs include palustrine wetlands with shrub-scrub, emergent, aquatic bottom, and intermittent riverine streambed sites and water regimes with seasonally flooded, semi-permanently flooded, or saturated areas. Columbia spotted frog populations are more successful in larger habitat patches that are less vulnerable to environmental stochasticity (e.g., drought) (Hossack et al. 2013).

Threats to Survival

Habitat modification and destruction is a major threat to the Columbia spotted frog (Hossack et al. 2013). The Great Basin population is particularly susceptible to habitat modification (Noss et al. 2006; Tait 2007). Habitat degradation and fragmentation has resulted from agricultural development, intensive livestock grazing, spring development, urbanization, and mining activities. Additional threats to this species include predation by non-native species (e.g., bullfrog) and possibly climate change (NatureServe 2010). Predicted changes in stream flow patterns, precipitation, and temperature from climate change could reduce habitat suitability and connectivity for populations, and, therefore, population success, in the Great Basin region (Pilliod et al. 2015). Research by Pilliod and Sherer (2015) indicates that habitat management may aid in population rebound for drastically diminished populations, but full recovery may take many years.

Occurrence in the Study Corridor

Locations of Columbia spotted frog in the study corridor are described under Affected Environment for Segments 5 and 6 and displayed in MV-8.

Due to the proximity of preferred habitat types for both the Northern and Great Basin populations of Columbia spotted frog within the vicinity of U.S. Highway 20, some suitable habitat for both may overlap in Segment 4. However, this analysis focuses on the Great Basin distinct population segment, located south of Highway 20, in Segments 5 and 6. For this analysis, habitat for the Columbia spotted frog Great Basin DPS was identified based on the presence of RCAs (refer to Section 3.2.3.4 for a description of RCAs) and other habitat criteria for areas within the range of the Columbia spotted frog Great Basin DPS. Columbia spotted frog habitat were classified as one of six habitat types based on (1) whether Columbia spotted frog is known to occupy an RCA and/or the 12-digit HUC that an RCA is within, and (2) characteristics of the RCA relative to Columbia spotted frog habitat requirements, including hydroperiod (perennial or intermittent) and whether salmonids are known to occur:

- Occupied habitat: RCAs with known occupancy
- Potentially occupied habitat – lower quality: RCAs with unknown occupancy that are within 12-digit HUCs with known occupancy, have a perennial hydroperiod (i.e., RCA categories 1 and 3, and wetlands included in RCA Category 4, refer to Table 3-93 in Section 3.2.3), and are inhabited by salmonids
- Potentially occupied habitat – higher quality: RCAs with unknown occupancy that are within 12-digit HUCs with known occupancy, have a perennial hydroperiod (i.e., RCA categories 1, 2, and 3, and wetlands included in RCA Category 4, refer to Table 3.-39 in Section 3.2.3), and are not inhabited by salmonids
- Potentially occupied dispersal/connectivity habitat: RCAs with unknown occupancy that are within 12-digit HUCs with known occupancy, do not have a perennial hydroperiod (i.e., RCA Category 4, excluding RCAs with wetlands, refer to Table 3-93 in Section 3.2.3), but are connected to an occupied habitat RCA
- Suitable habitat – low potential: RCAs with unknown occupancy that are within 12-digit HUCs with unknown occupancy, do not have a perennial hydroperiod (i.e., RCA Category 4, excluding RCAs with wetlands, refer to Table 3-93 in Section 3.2.3), and are inhabited by salmonids
- Suitable habitat – high potential: RCAs with unknown occupancy that are within 12-digit HUCs with unknown occupancy, do not have a perennial hydroperiod (i.e., RCA Category 4, excluding RCAs with wetlands, refer to Table 3-93 in Section 3.2.3), and are not inhabited by salmonids

Greater Sage-Grouse

Regulatory Status

The range-wide population of Greater Sage-Grouse became a candidate species for listing under the ESA as threatened or endangered on March 4, 2010 (75 *Federal Register* 13909). However, on October 2, 2015, the USFWS found that protection for Greater Sage-Grouse under the ESA was no longer warranted (80 *Federal Register* 59857). The BLM's ARMPAs (described in Section 3.2.4.2) were

a critical component to ensure the protection of Greater Sage-Grouse habitat and helped support the U.S. Fish and Wildlife Service's determination that Greater Sage-Grouse no longer warrants protection under the ESA.

In addition to its ESA candidate status, nevertheless, the Greater Sage-Grouse is a BLM and USFS sensitive species, and is considered vulnerable by Oregon. For management of Greater Sage-Grouse in Oregon, the ODFW uses the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (ODFW 2011), Oregon Sage-Grouse Action Plan (Sage-Grouse Conservation Partnership 2015a), State of Oregon Greater Sage-Grouse Habitat Mitigation Manual (Sage-Grouse Conservation Partnership 2015b); OAR Division 140 - Greater Sage-Grouse Conservation Strategy for Oregon, and Executive Order 15-18. For management of Greater Sage-Grouse in Idaho, the Idaho Greater Sage-Grouse Advisory Committee (2006) published management guidance in the Conservation Plan for the Greater Sage-Grouse in Idaho. This plan refers to local working group plans for more specific direction, which in the vicinity of the study corridor includes the Owyhee County Sage-grouse Management Plan (Owyhee County Sage-grouse Local Working Group 2013).

Life History

Greater Sage-Grouse breeding occurs between late February and early June and centers on a lek or strutting ground. Leks are usually located in open areas with greater visibility than surrounding areas. Male and female Greater Sage-Grouse attend leks where males perform ritualized courtship displays in the early morning hours. Mating is thought to occur on the lek with egg laying occurring soon after. All parental-investment functions (e.g., nesting, early and late brood-rearing) are performed by the female. Nesting usually occurs under sagebrush within 4 miles of a lek (ODFW 2011). Greater Sage-Grouse chicks are dependent on insect prey base after hatching (Johnson and Boyce 1990), but their diet shifts almost entirely to sagebrush as local vegetation desiccates in the late summer and fall (Schroeder et al. 1999).

According to the Idaho Sage-Grouse Local Working Groups Statewide Annual Report 2014 (Idaho Sage-Grouse Advisory Committee Technical Assistance Team 2015), in Idaho, male attendance at leks increased 5 percent from 2013, but decreased 1.7 percent from the five-year average. The average number of chicks per hen was 1.6, which is below the estimated number (2.25 or greater) needed for stable or increasing populations (Connelly and Braun 1997). In Oregon, chicks per female increased approximately 3 percent from 1980 to 2010 with an average of 1.59 chicks per female from 1993 to 2010 (ODFW 2011). No significant change in males per lek was found from 1980 to 2010 or over 5-year increments within the 30-year period.

Distribution and Habitat Requirements

Historical distribution of the Greater Sage-Grouse includes 13 U.S. states (Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Colorado, Utah, South Dakota, North Dakota, Nebraska, and Arizona) and three Canadian provinces (British Columbia, Alberta, and Saskatchewan) (Schroeder et al. 1999; Schroeder et al. 2004; Young et al. 2000). Current distribution represents approximately 56 percent of historical range across 11 U.S. states (Washington, Oregon, California, Nevada, Idaho,

Montana, Wyoming, Colorado, Utah, South Dakota, and North Dakota) and two Canadian provinces (Alberta and Saskatchewan) (Schroeder et al. 2004).

The distribution of Greater Sage-Grouse is closely aligned with the distribution of sagebrush-dominated landscapes (Schroeder et al. 2004). Greater Sage-Grouse require large, intact and connected expanses of sagebrush shrubland to exist (Aldridge et al. 2008; Wisdom et al. 2011). Greater Sage-Grouse typically occupy sagebrush vegetation but also may use a variety of other habitats (e.g., riparian meadows, and agricultural lands) intermixed in a sagebrush-dominated landscape (Shepard 2006). Sagebrush cover, height, and vegetative vertical structure have greater importance than the presence of particular sagebrush species when characterizing suitable Greater Sage-Grouse habitat (Connelly et al. 2000).

In Idaho, sagebrush patches adjacent to large, abrupt patches of grass or forb-dominated habitat (usually burned areas or crested wheatgrass seedings) received much less use on their periphery than more interspersed sagebrush patches (Shepard 2006). Aldridge and Boyce (2007) found Greater Sage-Grouse selected large expanses of sagebrush and avoided anthropogenic edge during the breeding season. Thus, the use of fragmented habitat by Greater Sage-Grouse is dependent on the juxtaposition of these habitats in relation to sagebrush and the hazards to birds using these areas (Connelly et al. 2011a).

Greater Sage-Grouse habitat use varies by season. Breeding, nesting, and brood-rearing habitat (i.e., spring and summer) is characterized by 10 to 25 percent sagebrush cover with an abundant grass and forb understory of greater than 15 percent cover (Connelly et al. 2000). The grass component is important in secluding nest sites, and forbs are important as browse for Greater Sage-Grouse and for providing habitat for protein-rich insects, which are necessary for chick growth. Suitable late brood-rearing and summer habitats include a variety of sagebrush communities that are capable of supporting a continued source of succulent forbs and insects, higher-elevation habitats where forbs are still present later in the year, agricultural fields, lower-elevation meadows, moist grassy areas, and riparian areas adjacent to sagebrush communities. Winter habitat consists of relatively large areas of sagebrush with 10 to 30 percent canopy cover that provide cover and forage above the snow level (Connelly et al. 2000). Greater Sage-Grouse are capable of traveling long distances, up to 50 miles, between seasonal habitats when necessary (Leonard et al. 2000).

The ODFW used average maximum counts of lekking male Greater Sage-Grouse to identify four lek density strata (percent of breeding population): very high (25 percent), high (50 percent), moderate (75 percent), and low (100 percent). Lek density strata, winter habitat use areas, and connectivity corridors were integrated to classify Greater Sage-Grouse habitat into one of two categories: core areas and low-density areas. Core area habitat consists of all sagebrush types or other habitats that support Greater Sage-Grouse that are encompassed by areas of very high, high, and moderate lek density strata; where low lek density strata overlap local connectivity corridors; or where known winter habitat use polygons overlap with either low lek density strata, connectivity corridors, or occupied habitat. Low-density area habitat encompasses the remainder. IDFG has not developed an analogous classification system for Greater Sage-Grouse habitat in Idaho.

There is little information available regarding minimum sagebrush patch sizes required to support populations of Greater Sage-Grouse. This is due in part to the migratory nature of some but not all populations, the lack of connectivity between seasonal habitats, and differences in local, regional, and range-wide ecological conditions that influence the distribution of sagebrush and associated understories. Where home ranges have been reported, they are extremely variable (1.5 to 238 square miles; Connelly et al. 2011b). Investigations from Idaho and Wyoming suggest that relatively large blocks of sagebrush habitat (more than 9,900 acres) are critical to successful reproduction and over-winter survival (Leonard et al. 2000; Walker et al. 2007). Occupancy of a home range also is based on multiple variables associated with both local vegetation characteristics and landscape characteristics (Knick et al. 2013). Pyke (2011) estimated that greater than 9,884 acres (4,000 hectares) was necessary for population sustainability; however, Pyke did not indicate whether this value was for migratory or non-migratory populations, or whether this included juxtaposition of all seasonal habitats. Large seasonal and annual movements emphasize the large landscapes required by the Greater Sage-Grouse (Connelly et al. 2011b; Knick et al. 2003).

Greater Sage-Grouse populations may be non-migratory or migratory, moving between or among seasonal use areas (Connelly et al. 2011b). Greater Sage-Grouse in Idaho are both migratory and non-migratory with migratory birds dispersing up to 77.5 miles (Idaho Sage-Grouse Advisory Committee 2006). Greater Sage-Grouse in Oregon generally exhibit one- stage migratory behavior with the largest movements (10 miles) occurring between breeding and summer habitats, which corresponds with elevational movements in mountains (ODFW 2011). Movements between summer and winter habitats (3 to 9 miles) were generally directed toward breeding areas, although Greater Sage-Grouse may travel considerable distances (over 19 miles) in severe winters to find food and cover (USFWS 2013).

Threats to Survival

Greater Sage-Grouse numbers have declined range-wide. Population declines have coincided with a decrease in habitat quality. The reasons for habitat loss vary from site to site, but include wildfire, urban expansion, development, agricultural conversion, herbicide treatments, rangeland seeding, noxious weeds and non-native grass species expansion, conifer encroachment, drought, and improper livestock grazing management (Connelly et al. 2011b; Pyke et al. 2015).

Knick and Connelly (2011) found that fire and human disturbance were the primary factors influencing fate of leks. Knick et al. (2003) reported 95 percent of active leks (3,184 leks) in their western states study area were in landscapes with less than 3 percent development; all lands surrounding leks were less than 14 percent developed.

Wildfire is one of the top threats to Greater Sage-Grouse in Idaho and Oregon. It causes loss of habitat, and has been identified as a primary factor associated with Greater Sage-Grouse population declines (USFWS 2010a). Greater Sage-Grouse typically select nest sites near the largest sagebrush plants that have a good herbaceous understory, which is precisely where wildfire or prescribed fire tends to travel. Thus, the mosaic of habitat that results from burning may actually diminish their productivity for Greater Sage-Grouse. Fire can reduce shrub cover, increase the amount of invasive plant species, and large intense fires can reduce habitat diversity. However, fire also can have beneficial impacts on Greater

Sage-Grouse habitat. Fire can reduce juniper cover and, under the right conditions, return sites to a more suitable mix of bunchgrass and sagebrush over time.

Juniper encroachment, another threat to Greater Sage-Grouse, affects more than 12 million acres in the Great Basin alone (Miller et al. 2008). Conifer encroachment fragments sagebrush habitat for Greater Sage-Grouse both by removing suitable cover (i.e., sagebrush) and by providing tall structures (i.e., trees) that attract predators of Greater Sage-Grouse, such as corvids (Doherty et al. 2008, 2010). A decline of shrubs is the most documented shift in understory vegetation following juniper encroachment. Mountain big sagebrush sites show 20 to 25 percent declines in shrub cover in response to trees reaching 50 percent of the maximum site potential (Miller et al. 2000). Corvid abundances have been positively correlated with higher nest predation rates of many birds, including Greater Sage-Grouse (ODFW 2011). Energy development has been identified as a threat to Greater Sage-Grouse. Direct and indirect disturbance, habitat loss, and fragmentation due to energy development have resulted in Greater Sage-Grouse population declines (USFWS 2013).

Comparing environmental conditions and levels of human disturbance on areas of former range (i.e., extirpated range) with areas still occupied by Greater Sage-Grouse (i.e., occupied range), Wisdom et al. (2011) presented five environmental variables that were the most significant in discriminating between former range and areas still occupied by Greater Sage-Grouse: sagebrush area, elevation, distance to transmission lines, distance to cellular towers, and land ownership.

While the amount of habitat available to Greater Sage-Grouse is very important, habitat pattern and quality is just as critical to long-term survival of the species. Fragmentation of habitat into smaller patches can result in extirpation of local Greater Sage-Grouse populations when functional connectivity among patches is lost. Leks separated by distances greater than 11 miles could be isolated due to decreased probability of dispersals from neighboring leks (Connelly et al. 2000). Isolation and reduced connectivity increases the probability of loss of genetic diversity and extirpation from stochastic events (Knick and Hanser 2011).

Occurrence in the Study Corridor

Both Greater Sage-Grouse PHMA and GHMA occur in the study corridor in Segments 2 through 4, only GHMA occurs in the study corridor in Segment 5, and IHMA and GHMA occur in the study corridor in Segment 6. No Sagebrush Focal Areas are located in the study corridor. Locations of habitat in the study corridor are described under Affected Environment for the relevant segments and displayed in MV-9.

For this analysis, effects of the B2H Project on Greater Sage-Grouse PHMA and GHMA are addressed. Effects of the B2H Project on IHMA in Idaho are also addressed. However, some portions of IHMA consist of lands that serve as management buffers between developed areas and PHMA and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy (Makela and Major 2012). Definitions of PHMA, IHMA, and GHMA are provided under Greater Sage-Grouse Policy and Management Guidance in Section 3.2.4.2.

Washington Ground Squirrel

Regulatory Status

The Washington ground squirrel is a former candidate for listing as threatened or endangered under the ESA (59 *Federal Register* 58982). On September 21, 2016, the USFWS announced that protection for Washington ground squirrel under the ESA was not warranted (81 *Federal Register* 64843).

The Washington ground squirrel is a BLM sensitive species and is listed as endangered by Oregon. In Oregon, some threats are being addressed as a result of its state listing, and by implementation of the Threemile Canyon Farms Multi-Species Candidate Conservation Agreement with Assurances, which protects 36 percent of known Oregon breeding colonies, one-third of known occupied habitat, from agricultural development. ODFW classifies Washington ground squirrel occupied habitat as Category 1 and Category 2 habitat (refer to Oregon Habitat Mitigation Policy under Regulatory Framework earlier in this section).

Taxonomy and Life History

The Washington ground squirrel is diurnal and semi-fossorial. It has a prolonged period of seasonal dormancy, escaping extremes of both winter and summer. Adults emerge from hibernation between January and early March, and breed soon after (Rickart and Yensen 1991).

Washington ground squirrels eat a broad range of succulent forb and grass stems, buds, leaves, flowers, roots, bulbs, seeds; they also eat insects and various agricultural crops (Rickart and Yensen 1991). Washington ground squirrels usually live less than 5 years and have high annual mortality rates. Causes of mortality included starvation or freezing during estivation/hibernation, predation by mammals and various birds of prey, disease, and human interference (Delavan 2008; USFWS 2010b). Delavan (2008) found that home range sizes varied from 435 to 77,021 square meters, with males having significantly larger home ranges than females, and home range sizes decreasing with increasing food availability. Males are more mobile and disperse greater distance than females. In Oregon, juvenile male dispersal distances ranged from 40 to 3,521 meters (131 to 11,551 feet), with a median of 880 meters (2,887 feet) (Delavan 2008; Klein et al. 2005).

Distribution and Habitat Requirements

The Washington ground squirrel is endemic to the Deschutes–Columbia Plateau sagebrush-steppe and grassland communities in eastern Oregon and southcentral Washington. Approximately two-thirds of the Washington ground squirrel total historical range has been converted to agricultural and residential uses, and recent surveys suggest that its current range has contracted toward the center of its historical range (75 *Federal Register* 69239). This species now occurs in Washington, east of the Columbia River in Adams, Douglas, Franklin, Grant, Lincoln, and Walla Walla Counties; and in north- central Oregon in the northern halves of Gilliam and Morrow Counties and in northwestern Umatilla County (75 *Federal Register* 69222).

The most densely occupied territories in Oregon occur on the Boardman Grasslands Important Bird Areas on the NWSTF Boardman and the adjacent Boardman Conservation Area, managed by the Nature Conservancy (Audubon Society 2013). The Important Bird Areas consist of these two land

parcels, totaling 69,000 acres. The parcels represent the largest remaining single block of predominantly native, ungrazed shrub-steppe and grassland habitats in the Columbia Basin. Washington ground squirrels are strongly associated with sagebrush-steppe and native bunchgrass habitats, and use areas with high sagebrush canopy cover and high grass and forb density (Delavan 2008; USFWS 2010b). Soil types essential for burrow excavation by Washington ground squirrel are distributed sporadically within the species' range, and have been seriously fragmented by human development in the Columbia Basin, particularly by conversion to agricultural use (Betts 1990; USFWS 2008a).

Threats to Survival

Overall threats to the survival for the Washington ground squirrel are summarized in the USFWS's 2010 candidate review (75 *Federal Register* 69239):

> Agricultural, residential, and wind power development along with other forms of development continue to eliminate Washington ground squirrel habitat in portions of its range. Throughout much of its range, Washington ground squirrel are threatened by the establishment and spread of invasive plant species, particularly cheatgrass, which alter available cover and food quantity and quality, and increase fire intervals. Additional threats include habitat fragmentation, recreational shooting, genetic isolation and drift, predation, disease, drought, and possible competition with related species in disturbed habitat at the periphery of their range.

Impacts on Washington ground squirrel from military readiness activities on the NWSTF Boardman were assessed in an EIS and the U.S. Department of the Navy (Navy) developed conservation measures for Washington ground squirrel in coordination with USFWS (Navy 2015). The contribution the B2H Project's impacts on Washington ground squirrel inhabiting the NWSTF Boardman in conjunction with those from Navy activities are discussed in the cumulative effects analysis in Section 3.3.4.

Occurrence in the Study Corridor

Washington ground squirrel is only found in Segment 1 of the study corridor, as described under Affected Environment for Segment 1 and displayed in MV-8.

The Navy considers all of the NWSTF Boardman to be Washington ground squirrel occupied habitat and mitigation actions are dependent on the quality of habitat affected, as outlined in the *Naval Weapons Systems Training Facility Boardman Integrated Natural Resources Management Plan* (Navy 2012). The occupied habitat on the NWSTF Boardman includes the 11,226-acre Washington ground squirrel Resource Management Area on the southern portion of the NWSTF Boardman, which is no longer used for military training activities and where habitat restoration efforts are focused; no ground-disturbing actions are allowed in the Resource Management Area (Navy 2015).

ODFW classifies Washington ground squirrel occupied habitat as Category 1 and Category 2 habitat, as defined in their Fish and Wildlife Habitat Mitigation Policy (refer to Oregon Habitat Mitigation Policy

under Section 3.2.4.2). Category 1 Washington ground squirrel habitat is considered by ODFW to be the single hole or cluster of holes of an active colony, as well as the required habitat for squirrel survival, which is a 785-foot buffer around the active holes. Current ODFW guidance identifies Washington ground squirrel colonies (including a 785-foot buffer of suitable habitat around the burrow or colony) as an avoidance area for energy development projects. ODFW defines Category 2 Washington ground squirrel habitat as an area of potential Washington ground squirrel use that extends 4,921 feet (1.5 kilometers) beyond the colony in similar habitat type and quality. The 1.5-kilometer distance corresponds to the 75th percentile for documented dispersal events of juvenile male squirrels as reported by Klein et al. (2005).

For this analysis, Category 1 habitat is referred to as occupied colony avoidance areas and Category 2 habitat is referred to as occupied colony dispersal areas. Washington ground squirrel habitat concentration areas, as designated by Washington Wildlife Habitat Connectivity Working Group (2012), are used to define and identify suitable habitat. Habitat concentration areas are defined by Washington Wildlife Habitat Connectivity Working Group as significant habitat areas that are expected or known to be important for a species based on survey data or habitat association. Washington ground squirrel habitat concentration areas were identified by Washington Wildlife Habitat Connectivity Working Group as modeled habitat with values greater than 0.25 and up to 1.0.

MIGRATORY BIRDS INCLUDING RAPTORS

Most bird species in the U.S., with the exception of non-migratory upland game species and a few non-native species such as the house sparrow and European starling, are protected under the federal MBTA of 1918, which prohibits injury or death to migratory birds and their active nests, eggs, and young. The MBTA provides a framework for state-managed hunting of some species and authorizes the issuance of permits for take of other birds under limited conditions such as for falconry, research, conservation, and to prevent crop predations. Protected migratory birds may be present as year-round residents in the study corridor, and some species may pass through the area during spring and fall migration periods. All birds of prey (raptors) are protected under the MBTA, with bald and golden eagles afforded additional protective measures under the Eagle Act and others receiving additional protection as special status species.

In 2000, the Oregon-Washington Partners in Flight published the Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000). This strategy is used to address the requirements contained in Executive Order 13186 (*Federal Register* 3853, 2001). Many of the birds identified in this plan also are addressed in the USFWS Birds of Conservation Concern (BCC) (USFWS 2008b). The BCC report identifies species, subspecies, and populations of migratory and non-migratory birds in need of additional conservation actions for each of the identified bird conservation regions (BCRs).

For the purposes of migratory bird management, the BCC report identifies BCRs, which are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues; the study corridor for the B2H Project includes portions of BCR 9 (Great Basin) and BCR 10

(Northern Rocky Mountains, U.S. portion only). BCR 9 includes the majority of Segment 1 and Segments 4, 5, and 6, while BCR 10 includes a small portion of Segment 1 and Segments 2 and 3.

Table 3-143 lists the BCCs in BCRs 9 and 10 that are known or have potential to occur within the study corridor. Many of the species are discussed in other portions of this section and have additional conservation rankings, including Brewer's sparrow (ID BLM S), ferruginous hawk (ID BLM S, ID SGCN), flammulated owl (ID BLM S, SV), Greater Sage-Grouse (ID BLM S, OR BLM S, USFS S, ST), Lewis's woodpecker (ID BLM S, OR BLM S, USFS S, CR), loggerhead shrike (ID BLM S), long-billed curlew (SV, ID SGCN), olive-sided flycatcher (ID BLM S, SV), peregrine falcon (American subspecies – ID BLM S, OR BLM S, USFS S, SV), sage sparrow (ID BLM S, ID SGCN), Swainson's hawk (SV), upland sandpiper (USFS S, CR), white-headed woodpecker (OR BLM S, USFS S, CR), and willow flycatcher (ID BLM S).

Table 3-143. Birds of Conservation Concern with Habitat in the Study Corridor

Species	Primary Wildlife Habitat Type (Specific Type if applicable)	Species is Included on Birds of Conservation Concern List for Bird Conservation Region		Occurrence Potential by Segment					
		BCR 9	BCR 10	1	2	3	4	5	6
Bald eagle[1,2]	RCA, Forest/Woodland	X	X	K	K	K	K	K	K
Black rosy-finch	Bare Ground/Cliff/Talus	X	X	N	N	N	M	M	M
Brewer's sparrow[1]	Shrubland (sagebrush)	X	X	M	M	K	K	K	K
Calliope hummingbird	Forest/Woodland, RCA	X	X	M	M	M	M	M	M
Cassin's finch	Forest/Woodland (conifer forest)	—	X	M	M	K	—	—	—
Eared grebe	RCA	X[3]	—	N	—	—	M	M	M
Ferruginous hawk[1]	Grassland, Shrubland, Forest/Woodland (western juniper woodland), Agriculture	X	X	K	K	K	K	K	K
Flammulated owl[1]	Forest/Woodland (coniferous woodlands and forest edges)	X	X	N	K	M	N	N	N
Golden eagle[1]*	Grassland, Shrubland, Forest/Woodland, Agriculture, Bare ground/Cliffs/Talus	X	—	K	—	—	K	K	K
Greater Sage-Grouse[1,4]	Shrubland (sagebrush)	X	—	N	—	—	K	K	K
Green-tailed towhee	Shrubland	X	—	M	—	—	M	M	M
Lewis's woodpecker[1]	Forest/Woodland, RCA	X	X	M	K	K	M	M	K
Loggerhead shrike[1]	Grassland, Shrubland, Forest/Woodland, Agriculture	X	X	K	K	K	K	K	K
Long-billed curlew[1]	Grassland	X	X	K	K	K	K	K	K
Olive-sided flycatcher*	Forest/Woodland (spruce and fir forests)	—	X	N	M	M	—	—	—

Table 3-143. Birds of Conservation Concern with Habitat in the Study Corridor

Species	Primary Wildlife Habitat Type (Specific Type if applicable)	Species is Included on Birds of Conservation Concern List for Bird Conservation Region		Occurrence Potential by Segment					
		BCR 9	BCR 10	1	2	3	4	5	6
Peregrine falcon[1,2]	Forest/Woodland, Bare Ground/Cliff/Talus, Developed/Disturbed	X[3]	X	M	K	K	M	M	K
Sage sparrow[1]	Shrubland (sagebrush), Forest/Woodland	X	X	M	M	M	M	K	K
Sage thrasher	Shrubland (sagebrush)	X	X	M	M	K	K	K	K
Swainson's hawk[1]	Grassland, Shrubland,, Agriculture	—	X	K	K	K	—	—	—
Upland sandpiper[1]	Grassland	—	X	N	M	M	—	—	—
White-headed woodpecker[1]	Forest/Woodland (ponderosa pine, subalpine fir)	X	X	N	M	K	N	N	N
Williamson's sapsucker	Forest/Woodland	X	X	N	M	M	N	N	N
Willow flycatcher[1,5]	RCA	X	X	M	M	K	M	M	M

Table Notes:

[1]Species with additional conservation rankings.

[2]Species is ESA delisted.

[3]Non-breeding in this Bird Conservation Region.

[4]Greater Sage-Grouse is addressed in greater detail in the individual subsections of this EIS.

[5] Non-listed subspecies or population of threatened or endangered species.

"—" = a segment in which the species is not on the Birds of Conservation Concern list for that region

BCR = Bird Conservation Region

K = Known to occur (documented within the study corridor)

L = Likely to occur (documented within B2H Project vicinity outside study corridor)

M = May occur (not documented in B2H Project vicinity but suitable habitat is present in study corridor and the B2H Project is within the species' range)

N = Does not occur

RCA = Riparian conservation area

X = Designated habitat is present

The Oregon portion of the B2H Project is located within the Pacific Flyway and the Idaho portion is within the Central Flyway; flyways are the total geographic area, including breeding and non-breeding habitat, that a migratory bird population or species travels to during its annual migration cycle (Kirby et al. 2008). Four designated Audubon Society Important Bird Areas are in the B2H Project area:

- The Boardman Grasslands Important Bird Areas, located in northern Morrow County on the NWSTF Boardman and the Boardman Conservation Area, which includes the largest remaining single block of predominantly native shrub-steppe and grassland habitats in the Columbia Basin.
- The Ladd Marsh Important Bird Areas, located near La Grande, which consists of a group of wetlands, marshes, and prairies totaling more than 6,000 acres.
- Snake River Birds of Prey Important Bird Areas, located near Boise, which is 485,832 acres and has one of the densest populations of nesting raptors in North America.

- Deer Flat National Wildlife Refuge Important Bird Areas, located near Boise, encompasses two major areas for breeding, wintering, and migrating birds on the Central Flyway, particularly waterfowl. Various raptors are known to or are expected to occur in the study corridor.

Table 3-144 identifies raptor species not already identified in Table 3-143 with known occurrence or habitat in the study corridor by segment.

Table 3-144. Additional Raptor Species with Known Occurrence or Habitat in the Study Corridor

Species	Primary Wildlife Habitat Type	Occurrence Potential By Segment					
		1	2	3	4	5	6
American kestrel	Grassland, Shrubland, Forest/Woodland, Agriculture	K	K	K	M	M	K
Barn owl	Grassland, Shrubland (shrub-steppe with big sage and shrub-steppe without big sage), Agriculture	K	K	K	K	M	M
Burrowing owl	Grassland, Shrubland, Agriculture	K	K	K	K	K	K
Coopers hawk	Forest/Woodland (western juniper woodland)	K	M	M	M	M	K
Great gray owl	Forest/Woodland	K	K	M	N	N	N
Great horned owl	Forest/Woodland (western juniper woodland)	K	M	K	M	M	M
Long-eared owl	Grassland, Shrubland, Agriculture	M	M	M	M	M	M
Northern goshawk	Forest/Woodland (coniferous forest)	K	K	K	M	M	K
Northern harrier	Grassland, Shrubland, RCA, Agriculture	K	M	K	M	M	K
Northern pygmy owl	Forest/Woodland	K	M	N	M	N	N
Northern saw-whet owl	Shrubland, Forest/woodland (coniferous woodland)	M	M	M	M	M	M
Osprey	RCA	K	M	K	M	M	M
Prairie falcon	Grassland, Shrubland, Agriculture	K	K	K	M	M	K
Red-tailed hawk	Grassland, Shrubland, Forest/Woodland (western juniper woodland), Agriculture	K	K	K	K	K	K
Rough-legged hawk	Agriculture, Grassland, RCA	K	M	M	M	M	M
Sharp-shinned hawk	Forest/Woodland	M	K	K	M	M	K
Short-eared owl	Grassland, Shrubland	K	K	K	K	K	K
Western screech owl	Forest/Woodland (western juniper woodland), RCA	M	M	M	M	M	K

Table Notes:

K = Known to occur (documented within the study corridor)

M = May occur (not documented in B2H Project vicinity but suitable habitat is present in study corridor and the B2H Project is within the species' range)

N = Does not occur

RCA = Riparian Conservation Areas

BIG GAME

Common big game species that occur in the B2H Project area include pronghorn, elk, and mule deer; less common big game species include bighorn sheep, moose, and white-tailed deer. Non-forest habitats provide the majority of the forage for big game, while forested habitats provide hiding and thermal cover. Some portions of the study corridor are used year-round by these species; however, some areas are used specifically as seasonal ranges. The study corridor contains habitats that have been designated by the ODFW, IDFG, and USFS for elk, mule deer, bighorn sheep, and pronghorn. Big

game habitat conditions differ across the study corridor. Existing roads at varying densities occur throughout the majority of big game seasonal ranges that intersect the study corridor. Although all seasonal ranges are important for the general fitness of mule deer, elk, and pronghorn populations, ODFW, IDFG, BLM, and USFS place management emphasis on seasonal ranges (i.e., winter range) that limit populations. For bighorn sheep, lands that provide unique habitat and terrain that is suitable for occupancy (i.e., population management units in Idaho and occupied range in Oregon) are the focus of management efforts. Population management units are bighorn sheep management areas designated by the IDFG and include areas that support persistent bighorn sheep populations (i.e., occupied habitat), as well as land used for movement that is not considered occupied habitat, whereas occupied range primarily represents occupied habitat in Oregon. Occupied habitat in Idaho is represented by lambing areas, as identified by IDFG, and core herd home range, as identified by Idaho BLM. The distribution of big game habitat in the B2H Project area is displayed in MV-10.

Table 3-145 identifies the managed big game habitat types found in the B2H Project area, and indicates the segments in which habitat is designated.

Table 3-145. Big Game Habitat Crossed by the B2H Project

Species	Occurrence by Segment					
	1	2	3	4	5	6
Elk Winter Range	X	X	X	X	X	—
Mule Deer Winter Range	X	X	X	X	X	X
Occupied Bighorn Sheep Habitat (Oregon)	—	—	X	—	—	—
Bighorn Sheep Population management units (Idaho)	—	—	—	—	—	X
Pronghorn Winter Range	—	—	—	X	X	—

Table Notes:
X = Designated habitat is present
Dash (—) = No designated habitat

TRADITIONAL FOODS

In all segments, the B2H Project crosses habitats for wildlife resources considered traditional foods by Native American tribes. In the issues identified for analysis, tribal concerns include potential impacts on fish and wildlife resources. These resources are discussed below by segment (waterfowl are discussed under Migratory Birds Including Raptors as species occurring in RCAs). Exercise of treaty rights could include, but is not limited to, hunting of small and large game for economic, religious, and cultural use.

SEGMENT 1—MORROW-UMATILLA

Wildlife Habitat

Applicant's Proposed Action Alternative and Alternative Routes and Route Variations

Agriculture and shrublands comprise the majority of wildlife habitat in Segment 1 (MV-7, Table 3-99 in Section 3.2.3). Although agriculture occurs throughout Segment 1, these areas are especially concentrated in the western portion of the segment; native-dominated vegetation communities (e.g., grasslands, shrublands) are more prevalent in the central and eastern portions of the segment.

Forest/woodland habitats occur at the extreme eastern end of the segment where the alternative routes enter the Blue Mountains. Riparian/wetland habitat (i.e., RCAs) also is present, though to a much more limited extent than the other habitat types. Additionally, RCAs and shrublands occur on the Coyote Springs Wildlife Area at the extreme western end of Segment 1 (Link 1-3) within the study corridors for the Applicant's Proposed Action Alternative, the Applicant's Proposed Action – Southern Route Alternative, the East of Bombing Range Road Alternative, and the West of Bombing Range Road – Southern Route Alternative; Coyote Springs Wildlife Area provides an important land base for the conservation and recreation of fish and wildlife and plays an important role for the fall and spring migrations of waterfowl in addition to resident upland game bird production. Refer to Table E-2 (Appendix E) for a list of the wildlife species commonly found in each wildlife habitat type in Segment 1.

Federally Proposed, Endangered, Threatened, and Candidate Species

Gray Wolf

Portions of the B2H Project located west of U.S. 395 are located in ODFW East Wolf Management Zone where gray wolves are listed as federally endangered and portions east of U.S. 395 are in the East Wolf Management Zone where gray wolves have been delisted as federally endangered. The locations of gray wolf habitat in the B2H Project area are described by alternative route below.

Applicant's Proposed Action Alternative

ODFW-designated known gray wolf use areas occur within the study corridor south of the Union County-Umatilla County border and east of Interstate 84 (Link 1-77), but are not crossed. Wolves in this area have been delisted as federally endangered.

Variation S1-B1

The proximity of Variation S1-B1 to known wolf use areas is the same as that described for the Applicant's Proposed Action Alternative.

Variation S1-B2

Variation S1-B2 crosses closer than the Applicant's Proposed Action and all alternatives to the known gray wolf use areas where the route variation is colocated with an existing 230-kV transmission line west of Interstate 84 just south of the Umatilla County-Union County border (Link 1-77).

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Wolf use areas do not occur within the Design Option 1 study corridor.

Design Options 2 and 3

Wolf use areas do not occur within the study corridors for Design Options 2 and 3.

East of Bombing Range Road Alternative

The proximity of the East of Bombing Range Road Alternative to known wolf use areas is the same as that described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The proximity of the Applicant's Proposed Action – Southern Route Alternative to known wolf use areas is the same as that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as that described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

ODFW-designated estimated wolf use areas are not crossed but occur in the study corridor west of U.S. 395 (Link 1-64) on private shrubland, grassland, and forested land where gray wolves retain federally endangered status. The proximity of the West of Bombing Range Road – Southern Route Alternative to known wolf use areas is the same as that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as that described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The proximity of the Longhorn Alternative to known wolf use areas is the same as that described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

The proximity of the Interstate 84 Alternative to known wolf use areas is the same as that described for the Applicant's Proposed Action Alternative.

Variations S1-A1 and S1-A2

Wolf use areas do not occur within the study corridor.

Interstate 84 – Southern Route Alternative

The proximity of the Interstate 84 – Southern Route Alternative to known wolf use areas is the same as that described for the Applicant's Proposed Action Alternative.

Other Special Status Species

Alternative Routes and Route Variations

Thirty-two special status species may occur, are likely to occur, or are known to occur in Segment 1 (Table 3-142). Habitat types available for special status species in the study corridor for all alternative routes are identified in Table 3-99 in Section 3.2.3. A large proportion of available shrubland and grassland habitat in the study corridor contains invasive species, such as cheatgrass, and has been previously affected by a variety of activities, such as agricultural and energy development. Special status species that have been documented in the Segment 1 study corridor include bobolink, common nighthawk, long-billed curlew, Swainson's hawk, burrowing owl, pallid bat, and white-tailed jackrabbit.

Descriptions and habitat requirements for these species, and others that may occur in this segment, are provided in Appendix E.

Special status species that use agricultural lands in Segment 1 include greater sandhill crane and Swainson's hawk. Greater sandhill crane is typically only found in Segment 1 during migration and Swainson's hawk, a long-distance migrant, during the breeding season.

Special status species such as common nighthawk, burrowing owl, Swainson's hawk, bats (e.g., pallid bat), and white-tailed jackrabbits forage within shrubland habitat. These species are affected by loss or modification of habitat for prey species. Two of these species, common nighthawk and Swainson's hawk, are long-distance migrants and would only be present in the B2H Project area during the breeding season. Burrowing owls are known to nest in shrub-steppe habitat in Morrow and Umatilla Counties and also migrate, although hatch-year males may sometimes over-winter. The most densely occupied breeding area for burrowing owls in the Pacific Northwest is located in Umatilla County, several miles northeast of the study corridor.

Bird species such as the bobolink and long-billed curlew typically use grasslands for both foraging and nesting habitat. The long-billed curlew is a ground nesting species utilizing grasslands as cover for cryptic nests constructed in shallow scrapes in the soil. The common nighthawk typically uses grasslands as foraging habitats, preferring gravelly soils and riverbanks for nesting habitat. Conservation threats to these birds include loss of breeding and foraging habitat resulting from land development practices.

Special status species that occur in forest/woodland habitat in the study corridor for Segment 1 include species such as cavity-nesting woodpeckers, great gray owl, northern goshawk, gray wolf, long-legged myotis, and western bumblebee. Forest/woodland habitat in Segment 1 occurs at the far eastern end of the segment on Wallowa-Whitman National Forest and private land. Threats to these species include habitat conversion and loss of habitat due to logging practices.

Special status species that use RCAs in Segment 1 include Columbia spotted frog (Northern distinct population segment), northern leopard frog, Woodhouse's toad, Jackson Lake springsnail, and western ridged mussel. Threats to these species include loss or modification of habitat due to soil erosion and sedimentation as a result of construction activities.

Washington Ground Squirrel

Segment 1 contains the most densely occupied habitat for Washington ground squirrel in Oregon. Suitable habitat, occupied colony avoidance areas, and/or occupied colony dispersal areas, are documented in the study corridor for the Applicant's Proposed Action Alternative and other alternative routes (Table 3-152, MV-8). Habitat for the Washington ground squirrel occurs on private and DOD lands in the study corridor. Surveys for Washington ground squirrel colonies were conducted in 2011, 2012, and 2013 along the Applicant's Proposed Action Alternative, the Longhorn Alternative, and East of Bombing Range Road Alternative, as well as the portions of the West of the Bombing Range Road – Southern Route and Applicant's Proposed Action – Southern Route that share an alignment with the

Applicant's Proposed Action, but not along the other alternative routes, as they were not being considered for the B2H Project at the time. Active Washington ground squirrel colonies were documented along all alternative routes surveyed.

Table 3-146 presents the resource inventory for Washington ground squirrel habitat types for all alternative routes and route variations in Segment 1.

Table 3-146. Alternative Route Comparison for Washington Ground Squirrel Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Occupied Colony Avoidance Areas	Occupied Colony Dispersal Areas	Suitable Habitat
Applicant's Proposed Action	91.9	0.1	5.9	12.5
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.4	2.8	8.4
Applicant's Proposed Action – Southern Route[1]	99.1	0.1	5.9	13.5
West of Bombing Range Road – Southern Route[1]	95.6	0.0	3.8	13.9
Longhorn	88.2	0.4	3.9	6.2
Interstate 84[1]	84.7	0.0	0.0	4.9
Variation S1-A1[1]	*18.5*	*0.0*	*0.0*	*1.0*
Variation S1-A2[1]	*18.5*	*0.0*	*0.0*	*11.0*
Interstate 84 – Southern Route[1]	93.4	0.0	0.0	6.0

Table Notes: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[1]Portions of this route that cross Washington ground squirrel suitable habitat were not surveyed for colonies.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses Washington ground squirrel occupied colony dispersal areas and suitable habitat inside the eastern boundary of the NWSTF Boardman (Link 1-27) where the B2H Project would replace an existing 69-kV transmission line; Washington ground squirrel occupied colony avoidance areas occur within the study corridor in this area but are not crossed. A Conference Opinion was issued by the USFWS stating that proposed activities by the Navy on the NWSTF Boardman would not likely jeopardize the continued existence of Washington ground squirrel (Navy 2015). The Navy considers all of the NWSTF Boardman to be Washington ground squirrel occupied habitat, including the 11,226-acre Washington ground squirrel Resource Management Area on the southern portion of the NWSTF Boardman, which is no longer used for military training activities where ground-disturbing activities are not allowed (Navy 2015); the Applicant's Proposed Action Alternative crosses the eastern edge of the Resource Management Area.

Adjacent to the southeasterly portion of the NWSTF Boardman (Link 1-35), Washington ground squirrel suitable habitat and occupied colony dispersal areas have been identified among agricultural fields and are crossed by the Applicant's Proposed Action Alternative; in this area occupied colony avoidance areas that extend from the NWSTF Boardman occur within the study corridor but are not crossed. East from the Umatilla County-Morrow County border (Link 1-60), the Applicant's Proposed Action

Alternative crosses Washington ground squirrel occupied colony avoidance and dispersal areas and suitable habitat on privately owned shrublands.

Variation S1-B1

Variation S1-B1 does not cross occupied or suitable Washington ground squirrel habitat.

Variation S1-B2

Variation S1-B2 does not cross occupied or suitable Washington ground squirrel habitat.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Design Option 1 crosses patches of suitable Washington ground squirrel habitat throughout the north-south portion, as well as occupied colony avoidance and dispersal areas east of and on the southeasterly portion of the NWSTF Boardman. Design Option 1 crosses the Washington ground squirrel Resource Management Area where it crosses the eastern boundary of the NWSTF Boardman and connects with the existing 69-kV transmission line.

Design Options 2 and 3

Design Option 2 and 3 crosses patches of suitable Washington ground squirrel habitat throughout the north-south portion, as well as occupied colony dispersal areas east of the southeasterly portion of the NWSTF Boardman and along the southern boundary of the NWSTF Boardman; Design Option 2 does not cross Washington ground squirrel occupied colony avoidance areas. Design Options 2 and 3 do not cross the Washington ground squirrel Resource Management Area.

East of Bombing Range Road Alternative

The locations where Washington grounds squirrel habitat is crossed by the East of Bombing Range Road Alternative east of the Umatilla County-Morrow County border (Link 1-60) is the same as those described for the Applicant's Proposed Action Alternative. Additionally, the route crosses suitable habitat patches among agricultural fields along Bombing Range Road (Link 1-25), as well as occupied colony avoidance and dispersal areas east of the southeasterly portion of the NWSTF Boardman (Link1-33).

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative crosses the same Washington ground squirrel habitat as that described for the Applicant's Proposed Action Alternative, including the Washington ground squirrel Resource Management Area on the NWSTF Boardman. The route also crosses shrublands and grasslands identified as suitable habitat just south of U.S. 395 in Umatilla County (Link 1-83); this area of suitable habitat has been not surveyed for Washington ground squirrel and may or may not contain active colonies.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as that described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

Washington ground squirrel habitat crossed by the West of Bombing Range Road – Southern Route Alternative, both east and west of Bombing Range Road itself, is the same as that crossed by the Applicant's Proposed Action Alternative, including the Washington ground squirrel Resource Management Area on the NWSTF Boardman. The portion of the route that diverges from the Applicant's Proposed Action Alternative is located on suitable habitat in shrubland and grassland valleys in a mountainous region in Morrow and Umatilla Counties (Links 1-62 and 1-64); this area of suitable habitat has not been surveyed for Washington ground squirrel and may or may not contain active colonies.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as that described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Washington ground squirrel occupied colony avoidance and dispersal areas and suitable habitat crossed by the Longhorn Alternative east of the Morrow County-Umatilla County border would be the same as that crossed by the Applicant's Proposed Action Alternative. Additionally, a portion of the route that diverges from the Applicant's Proposed Action Alternative east of the NWSTF Boardman (Link 1-15) would be located on occupied colony avoidance and dispersal areas on privately owned shrublands among agricultural fields.

Interstate 84 Alternative

The Interstate 84 Alternative crosses Washington ground squirrel suitable habitat south of the Umatilla River on privately owned shrubland (Links 1-31, 1-39, and 1-49); this area of suitable habitat has not been surveyed for Washington ground squirrel and may or may not contain active colonies.

Variations S1-A1 and S1-A2

The variations cross Washington ground squirrel suitable habitat south of the Umatilla River (Link 1-31 for Variation S1-A1 and Link 1-37 for Variation S2-A2) on privately owned shrubland; this area of suitable habitat has not been surveyed and may or may not contain active colonies.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative crosses the same Washington ground squirrel suitable habitat as the Interstate 84 Alternative south of the Umatilla River. The route also is located on the same Washington ground squirrel suitable habitat south of U.S. 395 as the Applicant's Proposed Action – Southern Route Alternative.

Migratory Birds Including Raptors

Segment 1 is within the migratory bird Pacific Flyway and contains habitat that supports many avian species identified as BCCs within BCRs 9 and 10 (Table 3-143). In addition, existing habitats provide nesting and foraging areas for a variety of raptors not listed as BCCs (Table 3-144).

Although fragmented by agricultural areas, habitat for shrubland and grassland species, such as sage sparrow, sage thrasher, and Brewer's sparrow, is available throughout the study corridor in Segment 1, including on the NWSTF Boardman. The NWSTF Boardman, along with the Boardman Conservation Area, has been designated as the Boardman Grasslands Important Bird Areas; 81 bird species have been documented on the NWSTF Boardman since 1979, 41 of which have been known to nest there (Navy 2012). Habitat for forest/woodland species, such as great horned owl, northern pygmy owl, and sharp-shinned hawk, is also present. Wetland/riparian habitat is limited, but species that occupy this habitat, such as willow flycatcher, may be found.

A detailed discussion of available habitat types in Segment 1 is presented in Section 3.2.3. Refer to Table 3-99 in Section 3.2.3 for the quantity of each habitat type in Segment 1. Migratory bird habitat present in the study corridor is described by alternative route below.

The shrublands and grasslands in Segment 1 provide hunting and breeding habitat for golden eagles, and forested areas near waterbodies in the study corridor are suitable for bald eagle use; locations of known eagle nests in the study corridor are presented in Table 3-147 and described by alternative route below. The location of a bald eagle winter roost site in relation to the alternative routes also is described.

Table 3-147. Number of Eagle Nests in Segment 1—Morrow-Umatilla

Alternative Route	Bald Eagle		Golden Eagle	
	1-Mile Corridor	10-Mile Corridor	1-Mile Corridor	10-Mile Corridor
Applicant's Proposed Action	0	0	0	6
Variation S1-B1	*0*	*0*	*0*	*1*
Variation S1-B2	*0*	*0*	*0*	*1*
East of Bombing Range Road	0	0	0	6
Applicant's Proposed Action – Southern Route	0	0	0	6
West of Bombing Range Road – Southern Route	0	0	0	7
Longhorn	0	0	0	6
Interstate 84	0	1	0	2
Variation S1-A1	*0*	*1*	*0*	*1*
Variation S1-A2	*0*	*1*	*0*	*1*
Interstate 84 – Southern Route	0	1	0	2

Applicant's Proposed Action Alternative

Much of the portion of the Applicant's Proposed Action Alternative that extends from the western end of Segment 1 east to where the route ascends the Blue Mountains crosses habitat for shrubland and grassland species (Links 1-65, 1-71, and 1-77), such as sage sparrow, sage thrasher, and Brewer's sparrow. Though in a more limited amount, this portion of the route also crosses habitat for wetland/riparian species, such as willow flycatcher. In particular, habitat for shrubland and grassland species is present on the Boardman Grasslands Important Bird Areas on the NWSTF Boardman, which the route crosses at the extreme western end of Segment 1 (Link 1-27). The eastern end of the route

crosses habitat for forest/woodland species (Link 1-77), such as great horned owl, northern pygmy owl, and sharp-shinned hawk, on Wallowa-Whitman National Forest and privately owned forest land.

No golden eagle nests are known to occur within 0.5 mile of the Applicant's Proposed Action Alternative and no bald eagle nests are known within 5 miles. The Applicant's Proposed Action Alternative crosses within 5 miles of golden eagle nests near the Morrow County-Umatilla County border north of where Butter Creek intersects Highway 74 (Link 1-60), and at the extreme eastern end of Segment 1 near the eastern edge of the Wallowa-Whitman National Forest (Link 1-77). Additionally, the Applicant's Proposed Action Alternative crosses within 5 miles of a bald eagle winter roost site on the Wallowa-Whitman National Forest at the extreme eastern end of Segment 1 (Link 1-77).

Variations S1-B1 and S1-B2

The variations crosses migratory bird habitat for forest/woodland species, such as great horned owl, northern pygmy owl, and sharp-shinned hawk, on the Wallowa-Whitman National Forest and privately owned forest land (Links 1-73, 1-75, and 1-77).

No golden eagle nests are currently known to occur within 0.5 mile of the variations and no bald eagle nests are currently known within 5 miles. The variations cross within 5 miles of a golden eagle nest, as well as a bald eagle winter roost site, at the extreme eastern end of Segment 1 near the eastern edge of the Wallowa-Whitman National Forest (Link 1-77).

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The undisturbed land crossed by Design Option 1 could support such grassland/shrubland migratory birds as golden eagle, sage sparrow, sage thrasher, and Brewer's sparrow, particularly on the NWSTF Boardman, which is part of the Boardman Grasslands Important Bird Areas.

Design Options 2 and 3

The undisturbed land crossed by Design Options 2 and 3 could support such grassland/shrubland migratory birds as golden eagle, sage sparrow, sage thrasher, and Brewer's sparrow. Boardman Grasslands Important Bird Areas on the NWSTF Boardman occur within the study corridors of the design options but are not crossed.

East Bombing Range Road Alternative

The migratory bird habitat crossed by the East of Bombing Range Road Alternative is the same as that described for the Applicant's Proposed Action Alternative, except for at the extreme western end of Segment 1 where the Boardman Grasslands Important Bird Areas on the NWSTF Boardman occur in the study corridor of the East of Bombing Range Road Alternative (Link 1-25) but are not crossed.

The proximity of bald and golden eagle nests and a bald eagle winter roost site to the East of Bombing Range Road Alternative is the same as that described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The migratory bird habitat crossed by the Applicant's Proposed Action – Southern Route Alternative is similar to that described for the Applicant's Proposed Action Alternative, including the habitat for shrubland and grassland species crossed on the Boardman Grasslands Important Bird Areas on the NWSTF Boardman.

The proximity of bald and golden eagle nests and a bald eagle winter roost site to the Applicant's Proposed Action – Southern Route Alternative is the same as that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as that described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The migratory bird habitat crossed by the West of Bombing Range Road – Southern Route Alternative is similar to that described for the Applicant's Proposed Action Alternative, including the habitat for shrubland and grassland species crossed on the Boardman Grasslands Important Bird Areas on the NWSTF Boardman.

The proximity of bald and golden eagle nests and a bald eagle winter roost site to the West of Bombing Range Road – Southern Route Alternative is the same as that described for the Applicant's Proposed Action Alternative, but, additionally, the West of Bombing Range Road – Southern Route Alternative crosses within 5 miles of a golden eagle nest west of the Morrow County-Umatilla County border where Highway 74 intersects the county border (Link 1-62).

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as that described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The migratory bird habitat is similar to that described for the Applicant's Proposed Action Alternative, except for at the extreme western end of Segment 1 where the Boardman Grasslands Important Bird Areas on the NWSTF Boardman are within the study corridor of the Longhorn Alternative (Link 1-15) but are not crossed.

The proximity of bald and golden eagle nests and a winter roost site to the Longhorn Alternative is the same as that described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

The migratory bird habitat crossed by the Interstate 84 Alternative is similar to that described for the Applicant's Proposed Action Alternative, except for that the Interstate 84 Alternative crosses more riparian/woodland habitat and less shrubland habitat, and at the extreme western end of Segment 1,

and the Boardman Grasslands Important Bird Areas on the NWSTF Boardman are in the study corridor of the Interstate 84 Alternative (Link 1-5) but are not crossed.

No bald or golden eagles are currently known to occur within 0.5 mile of the Interstate 84 Alternative. The route crosses within 5 miles of a bald eagle nest near the Umatilla River between Stanfield and Echo (Link 1-23). The Interstate 84 Alternative crosses within 5 miles of golden eagle nests near Rieth (Link 1-31) and at the extreme eastern end of Segment 1 near the eastern edge of the Wallowa-Whitman National Forest (Link 1-77). The alternative also crosses within 5 miles of a bald eagle winter roost site at the extreme eastern end of Segment 1 (Link 1-77) on Wallowa-Whitman National Forest.

Variation S1-A1

Most of the migratory bird habitat along this variation has been converted for human uses, including agriculture, which provides habitat for species such as loggerhead shrike and Swainson's hawk.

No bald or golden eagles are currently known to occur within 0.5 mile of Variation S1-A1. The variation crosses within 5 miles of a bald eagle nest near the Umatilla River between Stanfield and Echo (Link 1-23), and within 5 miles of a golden eagle nests near Rieth (Link 1-31).

Variation S1-A2

The migratory bird habitat crossed by the variation is primarily that of shrubland species, such as sage sparrow, sage thrasher, and Brewer's sparrow.

The proximity of bald and golden eagle nests to Variation S1-A2 is the same as that described for Variation S1-A1.

Interstate 84 – Southern Route Alternative

The migratory bird habitat crossed by the route is similar to that described for the Interstate 84 Alternative.

The proximity of bald and golden eagle nests to the Interstate 84 – Southern Route Alternative is the same as that described for the Interstate 84 Alternative. The alternative also crosses within 5 miles of a bald eagle winter roost site at the extreme eastern end of Segment 1 on Wallowa-Whitman National Forest (Link 1-77).

Big Game

Big game species present in Segment 1 include mule deer, white-tailed deer and elk. Cover is limited in Segment 1, and the study corridor provides some forage, although this is may be of poorer quality due to invasive species and extensive agricultural development. Designated winter range for elk and mule deer is concentrated in the eastern portion of Segment 1.

Segment 1 crosses three ODFW Wildlife Management Units (WMU) that include the Columbia Basin, Ukiah, and Starkey WMUs. In all three WMUs, mule deer populations are currently below management objectives (ODFW 2015b). Factors that can negatively affect mule deer populations in the B2H Project area include drought, severe winter weather, habitat degradation, and increased predation (ODFW

2003a). Elk populations in the Ukiah and Starkey WMUs also are currently below management objectives. The Columbia Basin WMU is considered an elk de-emphasized area (ODFW 2015c). Elk de-emphasis areas are characterized by high percentages of private land with ongoing elk damage to private property and agricultural crops, or high potential for such damage. Management objectives are not proposed for these areas, and the management focus is to minimize elk numbers and damage caused by elk (ODFW 2005). Factors that can negatively affect elk populations in the B2H Project area include a lack of habitat in large, unroaded areas, and habitat with inadequate hiding cover (ODFW 2003b).

Table 3-148 presents the miles of big game habitat crossed by the centerline of all alternative routes and route variations in Segment 1. Locations of mule deer and elk winter range crossed by the B2H Project are described by alternative route below and displayed in MV-10.

Table 3-148. Big Game Inventory Data for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Bighorn Sheep Oregon Occupied Range	Bighorn Sheep Population Management Units	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range
Applicant's Proposed Action	91.9	0.0	0.0	0.0	9.1	14.5
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.4*	*0.7*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.4*	*1.2*
East of Bombing Range Road	92.3	0.0	0.0	0.0	9.1	14.5
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	0.0	20.2	19.9
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	0.0	46.5	19.9
Longhorn	88.2	0.0	0.0	0.0	9.1	14.5
Interstate 84	84.7	0.0	0.0	0.0	9.1	14.5
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	0.0	0.0	20.2	19.9

Table Note: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative traverses a block of mule deer and elk winter range in Umatilla County that stretches from shrublands and grasslands east of U.S. 395 to where the route crosses the Blue Mountains (Links 1-63, 1-65, and 1-77).

Variations S1-B1 and Variation S1-B2

The variations' southern ends (Links 1-75 and 1-77) cross designated mule deer and the elk winter range.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross designated mule deer or elk winter range.

East Bombing Range Road Alternative

Designated big game habitat crossed by the East of Bombing Range Road Alternative is the same as that crossed by the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative crosses a large block of mule deer winter range in Umatilla County that extends south and east of where the route intersect U.S. 395 to where the route crosses the Blue Mountains (Links 1-83, 1-66, 1-65, and 1-77). Elk winter range overlaps with eastern portions of mule deer winter range crossed by the route (Links 1-66, 1-65, and 1-77).

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross designated mule deer or elk winter range.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative crosses a large block of mule deer winter range that extends from shrublands and grasslands at the eastern end of the route in Morrow County west to the Blue Mountains (Links 1-38, 1-62, 1-64, 1-66, 1-65, and 1-77). Elk winter range crossed is the same as that crossed by the Applicant's Proposed Action – Southern Route Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross designated mule deer or elk winter range.

Longhorn Alternative

Designated big game habitat crossed by the Longhorn Alternative is the same as that crossed by the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Designated big game habitat crossed by the Interstate 84 Alternative is the same as that crossed by the Applicant's Proposed Action Alternative.

Variations S1-A1 and S1-A2

The variations do not cross designated big game habitat.

Interstate 84 – Southern Route Alternative

Designated big game habitat crossed by Interstate 84 – Southern Route Alternative is the same as that crossed by the Applicant's Proposed Action – Southern Route Alternative.

Management Indicator Species and USFS Sensitive Species

Alternative Routes and Route Variations

The Applicant's Proposed Action and all alternative routes, as well as Variations S1-A1 and S1-A2, cross national forest land in Segment 1 (Link 1-77). The affected environment for MIS and USFS sensitive species is described in Appendix F.

SEGMENT 2—BLUE MOUNTAINS

Wildlife Habitat

Alternative Routes and Route Variations

Forests/woodlands, RCAs and shrublands comprise the majority of wildlife habitats in Segment 2 (MV-7, Table 3-102 in Section 3.2.3). A limited amount of grassland also is present. In particular, the Ladd Marsh Wildlife Area, which encompasses one of the largest remaining wetlands in northeast Oregon and provides habitat for waterfowl and other birds and wildlife, is crossed by central portions of the Mill Creek Alternative (Link 2-63). Rebarrow Forest, Winn Meadow, and conservation easements west of Ladd Marsh Wildlife Area provide habitat for elk and other wildlife moving between Ladd Marsh Wildlife Area and Glass Hill and are in central portions of Segment 2. Species occurring in Segment 2 that may use these important habitat areas are discussed below. Refer to Table E-2 (Appendix E) for a list of the wildlife species commonly found in each wildlife habitat type in Segment 2.

Special Status Species

Alternative Routes and Route Variations

Forty-eight special status species may occur, are likely to occur, or are known to occur in Segment 2 (Table 3-142). Information relating to the amount of habitat available for special status species within the analysis area is located in Table 3-102 in Section 3.2.3 and locations of habitat are depicted in MV-7. Special status species that are known to be present in Segment 2 include American peregrine falcon; several woodpecker species, including pileated woodpecker and Lewis's woodpecker, common night hawk; golden eagle; northern goshawk; Greater Sage-Grouse (discussed in greater detail below); olive-sided flycatcher; Swainson's hawk; American marten (dispersal habitat only); gray wolf; long-legged myotis; Townsend's big-eared bat; and Johnson's hairstreak. Species accounts for these species, and other species that may occur in this segment, are included in Appendix E.

Forest/woodland special status species that are known to or may occur in the study corridor include olive-sided flycatcher, pileated woodpecker, American marten, gray wolf, and fringed myotis. Some woodpecker species known to or likely to occur in Segment 2, such as pileated woodpecker, are strongly associated with old growth coniferous forest types known to occur in the Blue Mountains. Although old growth multi-strata forest does occur in the watersheds analyzed for the B2H Project, high-quality old growth habitat is very limited. Primary threats to primary cavity excavators are loss of habitat and habitat fragmentation due to forest clearing and silviculture practices. Olive-sided flycatchers use lower-elevation forest clearings adjacent to grasslands and shrublands for foraging habitat, preferring open canopy tree branches for nesting. The American marten and gray wolf use high alpine forest habitat, with wolves venturing into lower elevations, potentially hunting along forest margins. Use of the area by martens is expected to be limited to dispersal. Primary conservation threats to carnivores include habitat loss, fragmentation, and human-caused mortality. Sensitive bats occurring within this segment are primarily forest dwelling. They use forest canopies as foraging habitat, sometimes foraging along forest edges over shrublands and grasslands. These areas include utility corridors, especially those located near water sources. While these species will use rock outcroppings and caves for roosting, hibernation, and maternity roosts, they also are known to use forest trees for daytime roosts

outside of hibernation and breeding seasons. Forest dwelling bats exhibit high roost site fidelity at rock outcroppings and caves, but switching of daytime tree roosts is common, making an abundance of large trees and snags especially important in areas such as the Segment 2 B2H Project area where rock outcroppings and caves are very limited. Fringed myotis specifically use old growth forest for roosting habitat in Oregon. Spotted bats have more specific habitat requirements, with a preference for forest stands adjacent to conspicuous rock outcroppings. Threats to these species include habitat conversion and loss of habitat due to logging practices.

Special status species that use shrubland habitats include common nighthawk, Swainson's hawk, and pallid bat. These species use shrublands extensively for foraging and are susceptible to disturbances that cause them to abandon nesting and roosting sites and hibernacula. These species are affected by loss or modification of habitat for prey species. Common nighthawk and Swainson's hawk are long-distance migrants and would only be present in the B2H Project area during the breeding season.

Special status wildlife species that use RCAs in Segment 2 include Columbia spotted frog (Northern distinct population segment), northern leopard frog, Rocky Mountain tailed frog, Woodhouse's toad, and western ridged mussel. Threats to these species include loss or modification of habitat due to soil erosion and sedimentation as a result of construction activities. Although not a riparian obligate, Lewis's woodpecker may use decaying cottonwood trees for nesting and is threatened by dead tree and snag removal.

Bird species such as the bobolink and long-billed curlew typically use grasslands for both foraging and nesting habitat. The long-billed curlew is a ground nesting species using grasslands as cover for cryptic nests constructed in shallow scrapes in the soil. The common nighthawk typically uses grasslands as foraging habitats, preferring gravelly soils and riverbanks for nesting habitat. Conservation threats to these birds include loss of breeding and foraging habitat resulting from land development practices.

Greater Sage-Grouse

A small amount of Greater Sage-Grouse GHMA occurs in the Segment 2 study corridor (MV-9, Table 3-149). No leks have been identified in the study corridor in Segment 2.

Table 3-149 presents the miles of Greater Sage-Grouse habitat types crossed by the centerline of all alternative routes and route variations in Segment 2. Locations of Greater Sage-Grouse habitat crossed by the B2H Project are described by alternative route below and displayed in MV-9.

Table 3-149. Greater Sage-Grouse Inventory Data for Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length (miles)	Priority Habitat Management Areas	General Habitat Management Areas
Applicant's Proposed Action	33.8	0.0	3.2
Variation S2-A1	*2.8*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*

Table 3-149. Greater Sage-Grouse Inventory Data for Segment 2—Blue Mountains (miles crossed)			
Alternative Route	**Total Length (miles)**	**Priority Habitat Management Areas**	**General Habitat Management Areas**
Variation S2-C1	*9.3*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*3.2*
Variation S2-F2	*12.2*	*0.0*	*1.9*
Glass Hill	33.7	0.0	3.2
Variation S2-D1	*4.3*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*
Mill Creek	34.0	0.0	1.9
Table Note: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.			

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses the edges of several smaller blocks of Greater Sage-Grouse GHMA from approximately where the route crosses Highway 237 to approximately 3 miles to the northwest on the route (Links 2-85 and 2-75). The Applicant's Proposed Action Alternative crosses a large block of Greater Sage-Grouse GHMA from near the Union County-Baker County border to the eastern end of Segment 2 (Links 2-85 and 2-95).

Variations S2-A1, S2-A2, S2-B1, S2-B2, S2-C1, S2-C2, S2-E1, and S2-E1

The variations do not cross Greater Sage-Grouse habitat.

Variation S2-F1

Variation S2-F1 crosses the same Greater Sage-Grouse habitat as that described for the Applicant's Proposed Action Alternative.

Variation S2-F2

Variation S2-F2 crosses a large block of Greater Sage-Grouse GHMA from the Union County-Baker County border to the eastern end of Segment 2 (Link 2-90). GHMA also occurs within the study corridor approximately 1.5 miles southeast of where the variation intersects Interstate 84, east to where the variation intersects Highway 237 (Links 2-70 and 2-80). Additionally, a small area of PHMA on the Baker PAC occurs within the 3.1-mile indirect effects buffer at the southern end of Segment 2 (Link 2-90) (refer to Assessment of Residual Impacts in Section 3.2.4.4 Methods for an explanation of the 3.1-mile indirect effects buffer).

Glass Hill Alternative

The Glass Hill Alternative crosses the same Greater Sage-Grouse habitat as that described for the Applicant's Proposed Action Alternative.

Variation S2-D1 and S2-D2

The variations do not cross Greater Sage-Grouse habitat.

Mill Creek Alternative

The Mill Creek Alternative crosses and is in proximity to the same Greater Sage-Grouse habitat as that described for Variation S2-F2.

Migratory Birds Including Raptors

Segment 2 is in the migratory bird Pacific Flyway and contains habitats that support many avian species identified as BCCs within BCR 10 (Table 3-143).These habitats also provide nesting and foraging areas for a variety of raptors not listed as BCCs (Table 3-144). Habitat for forest/woodland species (e.g., Cassin's finch, flammulated owl, and Williamson's sapsucker), wetland/riparian species (e.g., willow flycatcher), shrubland species (e.g., sage thrasher and Brewer's sparrow), and, to a lesser extent, grassland species (e.g., long-billed curlew and upland sandpiper) is present in the study corridor in Segment 2 (Table 3-102 in Section 3.2.3 and MV-7). A detailed discussion of available wildlife habitats within the study corridor in Segment 2 is presented in Section 3.2.3. The Ladd Marsh Important Bird Area on the Ladd Marsh Wildlife Area, one of the largest remaining wetlands in northeast Oregon established to protect nesting and migrating waterfowl, is located in the central portion of Segment 2, approximately 5 miles southeast of La Grande (Link 2-63).

The shrublands and grasslands in Segment 2 provide hunting and breeding habitat for golden eagles, and forested areas near waterbodies in the study corridor are suitable for bald eagle use; locations of known eagle nests in the study corridor are presented in Table 3-150 and described by alternative route at the end of Segment 2 Affected Environment. The location of a bald eagle winter roost site in relation to the alternative routes also is described.

Table 3-150. Number of Eagle Nests in Segment 2—Blue Mountains

Alternative Route	Bald Eagle		Golden Eagle	
	1-Mile Corridor	10-Mile Corridor	1-Mile Corridor	10-Mile Corridor
Applicant's Proposed Action	0	2	2	15
Variation S2-A1	*0*	*0*	*0*	*1*
Variation S2-A2	*0*	*0*	*0*	*1*
Variation S2-B1	*0*	*1*	*1*	*3*
Variation S2-B2	*0*	*1*	*1*	*3*
Variation S2-C1	*0*	*1*	*0*	*4*
Variation S2-C2	*1*	*1*	*0*	*4*
Variation S2-E1	*0*	*1*	*0*	*1*
Variation S2-E2	*0*	*1*	*0*	*1*
Variation S2-F1	*0*	*1*	*1*	*12*
Variation S2-F2	*0*	*1*	*3*	*12*
Glass Hill	0	2	2	15
Variation S2-D1	*0*	*1*	*0*	*2*
Variation S2-D2	*0*	*1*	*0*	*2*
Mill Creek	0	2	6	16

Applicant's Proposed Action Alternative

Throughout Segment 2, the Applicant's Proposed Action Alternative crosses habitat for shrubland species, such as sage thrasher and Brewer's sparrow; forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker; and wetland/riparian species, such as willow flycatcher.

No bald eagle nests are known within 0.5 mile of the route. The Applicant's Proposed Action Alternative is within 5 miles of bald and golden eagle nests in the vicinity of Morgan Lake (Link 2-45), as well as golden eagle nests near where the route intersects Highway 244 (Link 2-20), near the Union County/Baker County border (Links 2-85 and 2-95), and northwest of where the route intersects Highway 237 (Link 2-85). The Applicant's Proposed Action Alternative also is within 5 miles of a bald eagle winter roost site on Wallowa-Whitman National Forest at the western end of Segment 2 (Links 2-1 and 2-5).

Variations S2-A1 and S2-A2

The variations cross habitat for grassland species, such as long-billed curlew and upland sandpiper, as well as habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker.

No bald eagle nests are known within 5 miles and no golden eagle nests within 0.5 mile of the variations. One golden eagle nest is within 5 miles of the eastern end of the variations (Links 2-5 and 2-7). The variations also are in within 5 miles of a bald eagle winter roost site on Wallowa-Whitman National Forest (Links 2-1, 2-3, 2-5, and 2-7).

Variations S2-B1 and S2-B2

The variations cross habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker; wetland/riparian species, such as willow flycatcher; and shrubland species, such as sage thrasher and Brewer's sparrow.

No bald eagle nests are known within 0.5 mile of the variations. One golden eagle nest is within 0.5 mile of the western end of the variations (Links 2-25 and 2-30) and a bald eagle nest is within 5 miles of the eastern end of the variations (Links 2-25 and 2-35). The variations also are within 5 miles of a bald eagle winter roost site on Wallowa-Whitman National Forest (Links 2-25 and 2-30).

Variation S2-C1

Variation S2-C1 crosses habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker, as well as habitat for shrubland species, such as sage thrasher and Brewer's sparrow.

No bald or golden eagle nests are known within 0.5 mile of the variation, but Variation S2-C1 is within 5 miles of bald and golden eagle nests in the vicinity of Morgan Lake (Link 2-45).

Variation S2-C2

Variation S2-C2 crosses habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker, as well as habitat for shrubland species, such as sage thrasher and Brewer's sparrow. The route variation also crosses, to a lesser extent, habitat for RCA species, such as willow flycatcher. In particular, habitat for RCA species is present on the Ladd Marsh Important Bird Areas on the Ladd Marsh Wildlife Area, of which the route variation crosses along a small portion on the western edge (Link 2-48).

No golden eagle nests are known within 0.5 mile of the variation. Variation S2-C2 is within 0.5 mile of a bald eagle nest west of Morgan Lake and within 5 miles of a golden eagle nest east of Morgan Lake (Link 2-48).

Variations S2-E1 and S2-E2

The variations cross habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker, as well as habitat for shrubland species, such as Brewer's sparrow and sage thrasher.

No bald or golden eagle nests are known within 0.5 mile of the variation, but the north ends of the variations are within 5 miles of a golden eagle nest (Links 2-55 and 2-60).

Variations S2-F1 and S2-F2

The variations cross habitat for grassland species, such as upland sandpiper and long-billed curlew; wetland/riparian species, such as willow flycatcher; and shrubland species, such as sage thrasher and Brewer's sparrow.

No bald eagle nests are known within 0.5 mile of the variations, but the variations are within 0.5 mile of golden eagle nests northwest of where the route intersects Highway 237 (Links 2-85 and 2-80).

Glass Hill Alternative

The Glass Hill Alternative crosses habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker; shrubland species, such as sage thrasher and Brewer's sparrow; and RCA, such as willow flycatcher.

No bald eagle nests are known within 0.5 mile of the route. The Glass Hill Alternative crosses within 5 miles of golden eagle nests near where the route intersects Highway 244 (Link 2-20), northwest of where the route intersects Highway 237 (Link 2-85), and near the Union County/Baker County border (Link 2-95). The Glass Hill Alternative also is within 5 miles of a bald eagle winter roost site on Wallowa-Whitman National Forest at the western end of Segment 2 (Links 2-1 and 2-5).

Variation S2-D1

Variation S2-D1 crosses habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker; wetland/riparian species, such as willow flycatcher; and shrubland species, such as sage thrasher and Brewer's sparrow.

No bald or golden eagle nests are known within 0.5 mile of the variation. Bald and golden eagle nests near Morgan Lake are within 5 miles of Variation S2-D2 (Links 2-42 and 2-47).

Variation S2-D2

Variation S2-D2 crosses habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker; RCA species, such as willow flycatcher; and grassland species, such as long-billed curlew and upland sandpiper.

No bald or golden eagle nests are known within 0.5 mile of the route. Bald and golden eagle nests near Morgan Lake are within 5 miles of Variation S2-D2 (Links 2-46).

Mill Creek Alternative

The Mill Creek Alternative crosses habitat for forest/woodland species, such as Cassin's finch, flammulated owl, and Williamson's sapsucker; shrubland species, such as sage thrasher and Brewer's sparrow; and RCA species, such as willow flycatcher. In particular, habitat for RCA species is present on the Ladd Marsh Important Bird Areas on the Ladd Marsh Wildlife Area, which the route crosses in a central portion of Segment 2 (Link 2-63).

No bald eagle nests are known within 0.5 mile of the route. The Mill Creek Alternative crosses within 5 miles bald and golden eagle nests in the vicinity of Morgan Lake (Links 2-10 and 2-12), as well as golden eagle nests near where the route intersects Highway 244 (Link 2-10), northwest of where the route intersects Highway 237 (Link 2-70), northwest of La Grande (Link 2-10), near the Union County/Baker County border (Link 2-90), and south of Ladd Marsh Wildlife Area (Link 2-63). The Mill Creek Alternative also is within 5 miles of a bald eagle winter roost site on Wallowa-Whitman National Forest at the western end of Segment 2 (Links 2-3 and 2-7).

Big Game

Big game species known to be present in Segment 2 include mule deer, white-tailed deer, and elk. Major habitat types used by big game species in Segment 2 consist primarily of forest/woodland and shrubland types, which provide forage, hiding, and thermal cover. Designated winter range for elk and mule deer is present throughout the majority of Segment 2.

Segment 2 crosses two ODFW WMUs that include the Starkey and Catherine Creek WMUs. In both WMUs, mule deer populations are currently below management objectives (ODFW 2015b). Elk populations in the Starkey WMU also are currently below management objectives, while elk populations in the Catherine Creek WMU are currently above management objectives (ODFW 2015c). Factors that can negatively affect mule deer elk populations in the B2H Project area are the same as those described for Segment 1.

Table 3-151 presents the miles of big game habitat types crossed by the centerline of all alternative routes and route variations in Segment 2. Locations of mule deer and elk winter range crossed by the B2H Project are described by alternative route below and displayed in MV-10.

Table 3-151. Big Game Inventory Data for Segment 2—Blue Mountains (miles crossed)			
Alternative Route	**Total Length (miles)**	**Mule Deer Winter Range**	**Elk Winter Range**
Applicant's Proposed Action	33.8	26.7	29.1
Variation S2-A1	*2.8*	*2.8*	*2.8*
Variation S2-A2	*2.9*	*2.9*	*2.9*
Variation S2-B1	*3.7*	*3.7*	*3.7*
Variation S2-B2	*3.8*	*3.8*	*3.8*
Variation S2-C1	*9.3*	*5.0*	*7.4*
Variation S2-C2	*8.8*	*5.6*	*6.8*
Variation S2-E1	*2.3*	*2.3*	*2.3*
Variation S2-E2	*2.6*	*2.6*	*2.6*
Variation S2-F1	*12.1*	*9.3*	*9.3*
Variation S2-F2	*12.2*	*10.2*	*10.2*
Glass Hill	33.7	26.6	29.0
Variation S2-D1	*4.3*	*2.8*	*4.3*
Variation S2-D2	*4.1*	*2.2*	*4.1*
Mill Creek	34.0	32.0	32.0
Table Note: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.			

Applicant's Proposed Action Alternative

Most of the Applicant's Proposed Action Alternative crosses elk or mule deer winter range.

Variations S2-A1, S2-A2, S2-B1, S2-B2, S2-E1, and S2-E2

The entire lengths of the variations cross elk and mule deer winter range.

Variations S2-C1 and S2-C2

The entire lengths of the variations cross elk and mule deer winter range, except for a portion near the eastern ends of the variations (Links 2-48 and 2-50).

Variation S2-F1

The entire length of the variation crosses elk and mule deer winter range, except for a portion near the western end of the route variation that stretches west from where the variation intersects the Oregon National Historic Trail (Link 2-75).

Variation S2-F2

The entire length of the variation crosses elk and mule deer winter range, except for a small portion where the variation crosses Interstate 84 (Link 2-70).

Glass Hill Alternative

Except for several small portions, the entire length of the Glass Hill Alternative crosses elk or mule deer winter range.

Variations S2-D1 and S2-D2

The entire lengths of the variations cross elk and mule deer winter range.

Mill Creek Alternative

Except for two small portions, the entire length of the Mill Creek Alternative crosses elk and mule deer winter range.

Management Indicator Species and USFS Sensitive Species

Alternative Routes and Route Variations

The Applicant's Proposed Action and all alternative routes, as well as Variations S2-A1 and S2-A2, cross national forest land in Segment 2 (Links 2-1, 2-3, 2-5, and 2-7). The affected environment for MIS is described in Appendix F.

USFS sensitive wildlife species that may occur on USFS-administered land in areas crossed by alternative routes in Segment 2 are the same as those described for Segment 1.

SEGMENT 3—BAKER VALLEY

Wildlife Habitat

Alternative Routes and Route Variations

Shrubland habitat is the dominant wildlife habitat type in the study corridor, with forest/woodland habitat concentrated in the northeast portion of Segment 3, along the Timber Canyon Alternative (MV-7, Table 3-106 in Section 3.2.3). A limited amount of grasslands and RCAs also are present in Segment 3. Refer to Table E-2 (Appendix E) for a list of the wildlife species commonly found in each wildlife habitat type in Segment 3.

Special Status species

Alternative Routes and Route Variations

Forty-eight special status species may occur, are likely to occur, or are known to occur in Segment 3 (Table 3-142). Information relating to the amount of habitat available for special status species within the study corridor is located in Table 3-106 in Section 3.2.3. GHMA locations are depicted in MV-7. Special status species that are known to be present in Segment 3 include American peregrine falcon; woodpecker species, including white-headed woodpecker and Lewis's woodpecker; common night hawk; golden eagle; Greater Sage-Grouse (discussed in greater detail below); Swainson's hawk; gray wolf; long-legged myotis; Townsend's big-eared bat; white-tailed jackrabbit; and Johnson's hairstreak. Species accounts for these species and others that may occur in this segment, as identified in Table 3-142, are included in Appendix E.

Special status species that use shrubland habitats include common nighthawk, pallid bat, and white-tailed jackrabbit. Nighthawks and pallid bats are susceptible to disturbances that cause them to abandon roosting and nesting sites and hibernacula. White-tailed jackrabbits forage on grasses and forbs in shrublands and are threatened by habitat modification and predation by large hawks.

Special status forest/woodland species present in the study corridor for Segment 3 include species such as cavity-nesting woodpeckers, olive-sided flycatcher, American marten (dispersal), and gray wolf. The majority of habitat for these species, in the form of dry ponderosa pine, mixed conifer, and

lodgepole pine forest types, is located along the Timber Canyon Alternative (including portions on the Wallowa-Whitman Nation Forest). Threats to special status species include habitat loss, modification, and fragmentation.

Special status wildlife species that use RCAs in Segment 3 include the Columbia spotted frog (Northern), northern leopard frog, Woodhouse's toad, and western ridged mussel. Threats to these species include loss or modification of habitat due to soil erosion and sedimentation as a result of construction activities. Although not a riparian obligate, Lewis's woodpecker may use decaying cottonwood trees for nesting and could be affected by dead tree and snag removal.

Bird species such as the bobolink and long-billed curlew typically use grasslands for both foraging and nesting habitat. The long-billed curlew is a ground nesting species using grasslands as cover for cryptic nests constructed in shallow scrapes in the soil. The common nighthawk typically uses grasslands as foraging habitats, preferring gravelly soils and riverbanks for nesting habitat. Conservation threats to these birds include loss of breeding and foraging habitat resulting from land development practices.

Greater Sage-Grouse

Garton et al. (2011) identified five Greater Sage-Grouse populations in Oregon. Segment 3 runs through one of these, the Baker population, which is located in northeast Oregon (minimum estimated spring population of 872 to 1,650 birds in 2010) (ODFW 2011). According to the ODFW Greater Sage-Grouse Strategy, the current amount of habitat available to this population is 853,848 acres.

An ODFW assessment of habitat connectivity provides evidence that connectivity is limited between Greater Sage-Grouse in the Baker population and northern Malheur County (ODFW 2011). The Baker population appears to be separated by topography and unsuitable habitat from the nearest population in Weiser, Idaho, by approximately 20 miles. Interseasonal movements of a radio-marked female Greater Sage-Grouse between its spring/summer range east of Keating, Oregon, and winter locations northwest of Weiser, Idaho (a distance of approximately 33 miles), indicate some connection of the Baker population with adjacent populations (USFWS 2013).

It is unknown if there is movement (dispersal) of birds from habitat east of Interstate 84 to habitats in the southwest portion of Baker County. The ODFW assumes that Greater Sage-Grouse populations east of Interstate 84 are closed to immigration or emigration (i.e., "closed populations"), and those near Malheur County are open populations (i.e., population size is regulated in part by immigration from populations north of Harper). A telemetry study involving 63 Greater Sage-Grouse in Baker County during 2009–2012 found no evidence of dispersal into Malheur County. Most birds occupied relatively small ranges during spring and summer months, but showed large movements to winter habitat. Several birds moved approximately 16 kilometers southwest to the Virtue Flat area for winter. One female moved out of the B2H Project area to winter in southwest Idaho (a distance of 33 miles) and returned to Oregon in spring (USFWS 2013).

More than 80 percent of the historical sagebrush habitat for the Baker population remains available today, but steeper habitat and rugged topography reduces the suitability for Greater Sage-Grouse (USFWS 2013). 300,000 acres in this region were identified by the USFWS as PACs and includes

much of the current range of the Baker population (USFWS 2013).The ODFW's Greater Sage-Grouse Conservation Assessment and Strategy has identified essential habitats which are referred to as core areas and are equivalent to PHMA. These core areas represent key habitat areas as determined by breeding bird densities, winter habitat use, and connective habitat use. In Oregon, these units are called Oregon PACs and represent approximately 90 percent of the breeding population within 38 percent of the species range in Oregon. In most cases, Oregon PACs identify biologically meaningful units for management and monitoring that are different from USFWS PACs documented in the 2013 COT Report. In some cases, Oregon PACs combine smaller core habitat polygons into a single unit (ODFW unpublished data).

Based on Integrated Landscape Assessment Project (ILAP) (Gaines et al. 2013) data, 75.9 percent (243,259 acres) of the 336,539-acre Baker Oregon PAC is comprised of existing Greater Sage-Grouse habitat and 24.1 percent (77,434 acres) is potential Greater Sage-Grouse habitat. Potential habitat consists of areas that are capable of supporting sagebrush but not currently suitable for Greater Sage-Grouse and include burned areas, agricultural land, areas encroached by junipers, and crested wheat plantings.

ODFW calculations of 2013 spring trend (moving 5-year average) count for the population in Baker core habitat estimates 571 birds, which is 62.6 percent below the 2003 baseline of 2,017 birds. There are 34 known leks/lek complexes within this core habitat area, 10 of which have not had any observed male attendance in the last 10 years. In 2015, the moving 5-year average population count in Baker core habitat dropped to 165 birds, triggering the hard adaptive management trigger established in the Oregon Greater Sage-Grouse ARMPA which requires that more restrictive management actions are taken to stop a severe deviation from Greater Sage-Grouse conservation objectives set forth in the ARMPA (BLM 2015a; Glen Frederick [BLM], personal communication, June 2016).

The Baker population is more at risk and likely less resilient than other populations, since connectivity to other populations appears limited. There is no redundancy in this population as all birds are believed to be in one general area. For the entire population, the environmental similarity to extirpated populations is high (Wisdom et al. 2011). Most (68 percent) of the Greater Sage-Grouse habitat for the Baker population is in private ownership and 31 percent is administered by BLM (ODFW 2011). This is the largest proportion of privately managed Greater Sage-Grouse habitat for any population in Oregon. The USFWS (2013) noted that there are limited regulatory mechanisms in place, making it uncertain as to whether state-recommended conservation measures and practices will be applied on the majority of lands within this population; however, Oregon's "Sage-Grouse Rule" (OAR 660-023-0115) directs counties to apply a program of mitigation to land-use proposals, establishes a metering mechanism that allows only one percent of each core area to be developed per 10-year increment, and establishes a hard ceiling that would not allow human-caused development to ever occupy more than three percent of any core area. The Magpie Peak area is a particularly important area of habitat for the Baker Oregon PAC. Impacts on this area would be estimated at a higher magnitude than adjacent areas (ODFW, personal communication, September 9, 2014).

Invasive weeds and juniper encroachment are considered to be the primary threats to this population (Hagen 2011), but other threats to this population include renewable energy development (primarily wind), energy transmission, and Off Highway Vehicle recreation (USFWS 2013). Multiple large wildfires have occurred in the southwest portions of the Baker Oregon PAC and the adjacent GHMA in the B2H Project area, including the 1,485-acre White Swan Fire (2001), the 4,402-acre Iron Mountain Fire (2006), 2,904-acre Pleasant Valley Fire (2007), and the 3,300 Radio Tower Fire (2014); the 2015 103,865-acre Cornet-Windy Ridge Fire only burned small portions of GHMA that are in the study corridor of the alternative routes (BLM n.d.; USGS 2016). The impact of wildfire on Greater Sage-Grouse habitat in the B2H Project area is discussed further in the wildlife resources cumulative effects analysis (Section 3.3.3.4).

Table 3-152 and MV-9 present the miles of Greater Sage-Grouse habitat types crossed by the centerline of all alternative routes and route variations in Segment 3. Locations of Greater Sage-Grouse habitat crossed by the B2H Projects are described by alternative route below.

Table 3-152. Greater Sage-Grouse Inventory Data for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Priority Habitat Management Areas	General Habitat Management Areas
Applicant's Proposed Action	55.2	30.2	17.1
Variation S3-A1	*12.4*	*8.1*	*4.3*
Variation S3-A2	*12.2*	*9.0*	*3.2*
Variation S3-B1	*13.9*	*13.6*	*0.3*
Variation S3-B2	*14.4*	*4.2*	*3.6*
Variation S3-B3	*14.7*	*4.2*	*1.9*
Variation S3-B4	*14.3*	*2.3*	*1.2*
Variation S3-B5	*14.0*	*2.3*	*4.3*
Variation S3-C1	*21.1*	*8.5*	*5.3*
Variation S3-C2	*21.7*	*8.7*	*5.7*
Variation S3-C3	*21.1*	*0.0*	*1.1*
Variation S3-C4	*21.4*	*0.0*	*1.1*
Variation S3-C5	*21.0*	*0.0*	*1.1*
Variation S3-C6	*24.7*	*0.0*	*9.4*
Flagstaff A	55.3	18.9	21.1
Timber Canyon	70.3	0.0	28.8
Flagstaff A – Burnt River Mountain	55.3	10.4	16.9
Flagstaff B	56.0	20.8	18.7
Flagstaff B – Burnt River West	55.7	13.2	13.4
Flagstaff B – Durkee	59.6	12.3	22.8

Table Note: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.

The number and occupancy status of leks within 0.25, 2.0, and 3.1 miles of the centerlines of the alternative routes and route variations are presented in Table 3-153. The locations of leks in relation to the B2H Project are described by alternative route below. The lek occupancy status classifications are

defined in Section 3.2.4.2 under Greater Sage-Grouse Policy and Management Guidance – Oregon Department of Fish and Wildlife Plans.

Table 3-153. Number of Greater Sage-Grouse Leks in Segment 3—Baker Valley

Alternative Route	Lek Occupancy Status	Number of Leks within 0.25, 2.0, and 3.1 Miles					
		Priority Habitat Management Areas			General Habitat Management Areas		
		0.25	2.0	3.1	0.25	2.0	3.1
Applicant's Proposed Action	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	1	6	0	1	1
	Occupied	0	0	4	0	0	0
	Occupied pending	0	4	7	0	0	0
	Historic	0	0	2	0	0	0
	Unknown	0	1	3	0	0	0
Variation S3-A1	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*1*	*4*	*0*	*0*	*0*
	Occupied	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied pending	*0*	*4*	*5*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	0	0	0	0	0	0
Variation S3-A2	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*1*	*4*	*0*	*0*	*0*
	Occupied	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied pending	*0*	*4*	*5*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*3*	*0*	*0*	*1*
	Occupied	*0*	*0*	*4*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Historic	*0*	*0*	*2*	*0*	*0*	*0*
	Unknown	*0*	*1*	*1*	*0*	*0*	*0*
Variation S3-B2	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*3*	*0*	*0*	*1*
	Occupied	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*1*	*1*	*0*	*0*	*0*
Variation S3-B3	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*3*	*0*	*0*	*1*
	Occupied	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*1*	*1*	*0*	*0*	*0*

Table 3-153. Number of Greater Sage-Grouse Leks in Segment 3—Baker Valley							
Alternative Route	Lek Occupancy Status	Number of Leks within 0.25, 2.0, and 3.1 Miles					
		Priority Habitat Management Areas			General Habitat Management Areas		
		0.25	2.0	3.1	0.25	2.0	3.1
Variation S3-B4	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*3*	*0*	*0*	*1*
	Occupied	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*1*	*1*	*0*	*0*	*0*
Variation S3-B5	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*3*	*0*	*0*	*1*
	Occupied	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*1*	*1*	*0*	*0*	*0*
Variation S3-C1	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*0*	*2*	*0*	*0*	*0*
Variation S3-C2	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*0*	*2*	*0*	*0*	*0*
Variation S3-C3	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*0*	*2*	*0*	*0*	*0*
Variation S3-C4	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*0*	*2*	*0*	*0*	*0*

Table 3-153. Number of Greater Sage-Grouse Leks in Segment 3—Baker Valley							
Alternative Route	**Lek Occupancy Status**	**Number of Leks within 0.25, 2.0, and 3.1 Miles**					
		Priority Habitat Management Areas			**General Habitat Management Areas**		
		0.25	**2.0**	**3.1**	**0.25**	**2.0**	**3.1**
Variation S3-C5	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*0*	*2*	*0*	*0*	*0*
Variation S3-C6	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*2*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*0*	*0*	*0*	*0*
	Unknown	*0*	*0*	*2*	*0*	*0*	*0*
Flagstaff A	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	2	6	0	1	1
	Occupied	0	0	1	0	0	0
	Occupied pending	0	4	7	0	0	0
	Historic	0	0	0	0	0	0
	Unknown	0	1	3	0	0	0
Timber Canyon	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	0	0	0	0	0
	Occupied	0	0	0	0	0	0
	Occupied pending	0	0	4	0	0	1
	Historic	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0
Flagstaff A – Burnt River Mountain	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	2	6	0	1	1
	Occupied	0	0	1	0	0	0
	Occupied pending	0	4	7	0	0	0
	Historic	0	0	0	0	0	0
	Unknown	0	1	3	0	0	0
Flagstaff B	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	2	6	0	1	1
	Occupied	0	0	1	0	0	0
	Occupied pending	0	4	7	0	0	0
	Historic	0	0	0	0	0	0
	Unknown	0	1	3	0	0	0

Table 3-153. Number of Greater Sage-Grouse Leks in Segment 3—Baker Valley							
Alternative Route	Lek Occupancy Status	Number of Leks within 0.25, 2.0, and 3.1 Miles					
		Priority Habitat Management Areas			General Habitat Management Areas		
		0.25	2.0	3.1	0.25	2.0	3.1
Flagstaff B – Burnt River West	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	4	6	0	1	1
	Occupied	0	0	1	0	0	0
	Occupied pending	0	4	7	0	0	0
	Historic	0	0	0	0	0	0
	Unknown	0	1	3	0	0	0
Flagstaff B – Durkee	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	2	7	0	1	1
	Occupied	0	0	1	0	0	0
	Occupied pending	0	4	7	0	0	0
	Historic	0	0	0	0	0	0
	Unknown	0	1	3	0	0	0

Applicant's Proposed Action Alternative

A large portion of the Applicant's Proposed Action Alternative in Segment 3 crosses PHMA on the western edge of the Baker Oregon PAC (Links 3-4, 3-22, 3-26, and 3-28) and is within 3.1 miles of occupied, occupied pending, unoccupied pending, historic, and unknown status leks; however, no leks are closer than 0.25 mile. The Applicant's Proposed Action Alternative also crosses blocks of Greater Sage-Grouse GHMA at the beginning, middle, and end of the route in Segment 3 (Links 3-4, 3-54, 3-78, and 3-80).

Variations S3-A1 and S3-A2

The entire lengths of the variations cross either Greater Sage-Grouse GHMA or PHMA, with the majority of the variations crossing PHMA in the Baker Oregon PAC (Links 3-4, 3-12, and 3-14). The entire length of Variation S3-A2 is colocated with an existing transmission line. The variations also are within 3.1 miles of occupied, occupied pending, and unoccupied pending leks, but none are closer than 0.25 mile.

Variation S3-B1

The entire length of Variation S3-B1 crosses Greater Sage-Grouse PHMA on the Baker Oregon PAC, except for a very small portion of the extreme southern end of the variation that crosses GHMA (Link 3-28). The variation also is within 3.1 miles of occupied, occupied pending, unoccupied pending, historic, and unknown status leks, but none are closer than 0.25 mile.

Variations S3-B2 and S3-B3

Northern and central portions of Variation S3-B2 cross Greater Sage-Grouse PHMA on the Baker Oregon PAC (Links 3-24, 3-37, and 3-41). The variation also is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks, but none are closer than 0.25 mile. Additionally, central and southern portions of the variation cross GHMA (Links 3-47 and 3-48).

Variation S3-B4

The northern end of Variation S3-B4 crosses Greater Sage-Grouse PHMA on the Baker Oregon PAC (Link 3-24) and the southern end crosses GHMA (Link 3-48). The variation also is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks, but none are closer than 0.25 mile.

Variation S3-B5

The northern end of Variation S3-B5 crosses Greater Sage-Grouse PHMA on the Baker Oregon PAC (Link 3-24). The variation also is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks, but none are closer than 0.25 mile. Additionally, central and southern portions of the variation cross GHMA (Links 3-47 and 3-48).

Variations S3-C1 and S3-C2

The northern portions of the variations cross Greater Sage-Grouse PHMA on the Baker Oregon PAC (Link 3-58) and central portions cross GHMA (Links 3-78 and 3-80). The majority of Variation S3-C2 that crosses Greater Sage-Grouse PHMA is colocated with an existing transmission line. The variations also are within 3.1 miles of unoccupied pending and unknown status leks, but none are closer than 2 miles.

Variations S3-C3, S3-C4, and S3-C5

The variations do not cross Greater Sage-Grouse PHMA, but do cross a small portion of GHMA at the northern end of the variations (Link 3-56). The variations also are within 3.1 miles of unoccupied pending and unknown status leks, but none are closer than 2 miles.

Variation S3-C6

Variation S3-C5 does not cross Greater Sage-Grouse PHMA, but does cross a small portion of GHMA at the northern end of the variation (Link 3-56) and a large portion of GHMA near the southern end of the variation (Link 3-90). The variation also is within 3.1 miles of unoccupied pending and unknown status leks, but none are closer than 2 miles. Additionally, the variation crosses north of PHMA on the Cow Valley Oregon PAC.

Flagstaff A Alternative

Large northern and central portions of the Flagstaff A Alternative cross Greater Sage-Grouse PHMA on the western edge of the Baker Oregon PAC (Links 3-4, 3-22, 3-24, and 3-31). Additionally, the alternative is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks; however, no leks are closer than 0.25 mile. The Flagstaff A Alternative also crosses blocks of Greater Sage-Grouse GHMA at the northern, central, and southern portions of the route (Links 3-4, 3-47 3-48, 3-54, 3-78, and 3-80).

Timber Canyon Alternative

PHMA on the Baker Oregon PAC is within the study corridor of the Timber Canyon Alternative (Links 3-6 and 3-8) but is not crossed. A large amount of GHMA is crossed by the alternative at its southern end (Link 3-80), as well as a smaller portion at the alternative's northern end (Link 3-6). Portions of the

Timber Canyon Alternative also are within 3.1 miles of occupied pending leks, but none are closer than 2 miles.

Flagstaff A – Burnt River Mountain Alternative

A large northern portion of the Flagstaff A – Burnt River Mountain Alternative crosses Greater Sage-Grouse PHMA on the western edge of the Baker Oregon PAC (Links 3-12, 3-14, and 3-24). Additionally, the alternative is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks; however, no leks are closer than 0.25 mile. The Flagstaff A – Burnt River Mountain Alternative also crosses blocks of Greater Sage-Grouse GHMA at northern and central portions of the route (Links 3-10, 3-40, 3-46, 3-47 3-48, and 3-54).

Flagstaff B Alternative

Large northern and central portions of the Flagstaff B Alternative cross Greater Sage-Grouse PHMA on the western edge of the Baker Oregon PAC (Links 3-12, 3-14, 3-24, 3-31, and 3-41). Additionally, the alternative is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks; however, no leks are closer than 0.25 mile. The Flagstaff B Alternative also crosses blocks of Greater Sage-Grouse GHMA at the northern, central, and southern portions of the route (Links 3-4, 3-46, 3-48, 3-70, and 3-80).

Flagstaff B – Burnt River West Alternative

A large northern portion of the Flagstaff B – Burnt River West Alternative crosses Greater Sage-Grouse PHMA on the western edge of the Baker Oregon PAC (Links 3-12, 3-14, 3-24, 3-31, and 3-41). Additionally, the alternative is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks; however, no leks are closer than 0.25 mile. The Flagstaff B – Burnt River West Alternative also crosses blocks of Greater Sage-Grouse GHMA at northern and central portions of the route (Links 3-10, 3-46, 3-48, and 3-54).

Flagstaff B – Durkee Alternative

A large northern portion of the Flagstaff B – Durkee Alternative crosses Greater Sage-Grouse PHMA on the western edge of the Baker Oregon PAC (Links 3-12, 3-14, 3-24, 3-31, and 3-41). Additionally, the alternative is within 3.1 miles of occupied, occupied pending, unoccupied pending, and unknown status leks; however, no leks are closer than 0.25 mile. The Flagstaff B – Durkee Alternative also crosses blocks of Greater Sage-Grouse GHMA at northern, central, and southern portions of the route (Links 3-4, 3-46, 3-48, 3-54, and 3-90). Additionally, PHMA on the Cow Valley Oregon PAC occurs in the study corridor at the extreme southern end of the alternative route (Link 3-90).

Migratory Birds Including Raptors

Segment 3 is in the migratory bird Pacific Flyway and contains habitats that support many avian species identified as BCCs within BCR 10 (Table 3-143). These habitats also provide nesting and foraging areas for a variety of raptors (Table 3-142). Habitat for forest/woodland species (e.g., Cassin's finch and white-headed woodpecker), shrubland species (e.g., Brewer's sparrow and sage thrasher), and, to a lesser extent, grassland species (e.g., long-billed curlew) and RCA species (e.g., willow

flycatcher), is present in the study corridor in Segment 3 (Table 106 in Section 3.2.3 and MV-7). A detailed discussion of available wildlife habitats within the study corridor in Segment 3 is presented in Vegetation Resources, Section 3.2.3.

The shrublands and grasslands in Segment 3 provide hunting and breeding habitat for golden eagles, and forested areas near waterbodies in the study corridor are suitable for bald eagle use; locations of known eagle nests in the study corridor are presented in Table 3-147 and described by alternative route at the end of Segment 3 Affected Environment.

Table 3-154. Number of Eagle Nests in Segment 3—Baker Valley

Alternative Route	Bald Eagle		Golden Eagle	
	1-Mile Corridor	10-Mile Corridor	1-Mile Corridor	10-Mile Corridor
Applicant's Proposed Action	0	0	8	56
Variation S3-A1	*0*	*0*	*4*	*22*
Variation S3-A2	*0*	*0*	*4*	*23*
Variation S3-B1	*0*	*0*	*3*	*16*
Variation S3-B2	*0*	*0*	*1*	*13*
Variation S3-B3	*0*	*0*	*1*	*13*
Variation S3-B4	*0*	*0*	*1*	*13*
Variation S3-B5	*0*	*0*	*1*	*13*
Variation S3-C1	*0*	*0*	*2*	*27*
Variation S3-C2	*0*	*0*	*2*	*28*
Variation S3-C3	*0*	*0*	*1*	*29*
Variation S3-C4	*0*	*0*	*1*	*29*
Variation S3-C5	*0*	*0*	*2*	*29*
Variation S3-C6	*0*	*0*	*0*	*31*
Flagstaff A	0	0	6	54
Timber Canyon	0	1	0	49
Flagstaff A – Burnt River Mountain	0	0	5	56
Flagstaff B	0	0	6	54
Flagstaff B – Burnt River West	0	0	6	57
Flagstaff B – Durkee	0	0	4	58

Applicant's Proposed Action Alternative

Throughout Segment 3, the Applicant's Proposed Action Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the Applicant's Proposed Action Alternative crosses habitat for RCA species, such as willow flycatcher, and grassland species, such as long-billed curlew. No bald eagle nests are known within 5 miles, but the Applicant's Proposed Action Alternative is within 5 miles of golden eagle nests throughout Segment 3.

Variations S3-A1 and S3-A2

The variations cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the variations cross habitat for RCA species, such as willow flycatcher. No bald eagle nests are known within 5 miles, but the variations are within 5 miles of golden eagle nests.

Variations S3-B1, S3-B2, S3-B3, S3-B4, and S3-B5

The variations cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the variations crosses habitat for RCA species, such as willow flycatcher, and grassland species, such as long-billed curlew. No bald eagle nests are known within 5 miles, but the variations are within 5 miles of golden eagle nests.

Variations S3-C1 and S3-C2

The variations cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the variations crosses habitat for RCA species, such as willow flycatcher, and grassland species, such as long-billed curlew. No bald eagle nests are known within 5 miles, but the variations are within 5 miles of golden eagle nests.

Variations S3-C3, S3-C4, S3-C5, and S3-C6

The variations cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the variations cross habitat for RCA species, such as willow flycatcher; grassland species, such as long-billed curlew; and forest/woodland species, such as Cassin's finch and white-headed woodpecker. No bald eagle nests are known within 5 miles, but Variation S3-C3 is within 5 miles of golden eagle nests.

Flagstaff A Alternative

Throughout Segment 3, the Flagstaff A Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the Flagstaff A Alternative crosses habitat for RCA species, such as willow flycatcher, and grassland species, such as long-billed curlew. No bald eagle nests are known within 5 miles of the route, but the Flagstaff A Alternative is within 5 miles of golden eagle nests throughout Segment 3.

Timber Canyon Alternative

Throughout Segment 3, the Timber Canyon Alternative crosses habitat for forest/woodland species, such as Cassin's finch and white-headed woodpecker, as well as shrubland species, such as Brewer's sparrow and sage thrasher. To a lesser extent, the Timber Canyon Alternative crosses habitat for RCA species, such as willow flycatcher, and grassland species, such as long-billed curlew. The Timber Canyon Alternative is within 5 miles of a bald eagle nest near Richland (Link 3-8), as well as golden eagle nests throughout Segment 3; none of the eagle nests are within 0.5 mile of the route.

Flagstaff A – Burnt River Mountain Alternative

Throughout Segment 3, the Flagstaff A – Burnt River Mountain Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher. To a lesser extent, the Flagstaff A – Burnt River Mountain Alternative crosses habitat for RCA species, such as willow flycatcher; grassland species, such as long-billed curlew; and forest/woodland species, such as Cassin's finch and white-headed woodpecker. No bald eagle nests are known within 5 miles of the route, but the Flagstaff A – Burnt River Mountain Alternative is within 5 miles of golden eagle nests throughout Segment 3.

Flagstaff B Alternative

Throughout Segment 3, the Flagstaff B Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher. To a lesser extent, the Flagstaff B Alternative crosses habitat for RCA species, such as willow flycatcher, and grassland species, such as long-billed curlew. No bald eagle nests are known within 5 miles of the route, but the Flagstaff B Alternative is within 5 miles of golden eagle nests throughout Segment 3.

Flagstaff B – Burnt River West Alternative

Throughout Segment 3, the Flagstaff B – Burnt River West Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher. To a lesser extent, the Flagstaff B – Burnt River West Alternative crosses habitat for RCA species, such as willow flycatcher; grassland species, such as long-billed curlew; and forest/woodland species, such as Cassin's finch and white-headed woodpecker. No bald eagle nests are known within 5 miles of the route, but the Flagstaff B – Burnt River West Alternative is within 5 miles of golden eagle nests throughout Segment 3.

Flagstaff B – Durkee Alternative

Throughout Segment 3, the Flagstaff B – Durkee Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher. To a lesser extent, the Flagstaff B – Durkee Alternative crosses habitat for RCA species, such as willow flycatcher; grassland species, such as long-billed curlew; and forest/woodland species, such as Cassin's finch and white-headed woodpecker. No bald eagle nests are known within 5 miles of the route, but the Flagstaff B – Durkee Alternative is within 5 miles of golden eagle nests throughout Segment 3.

Big Game

Big game species present in the B2H Project area for Segment 3 include mule deer, white-tailed deer, elk, pronghorn, and bighorn sheep. Major habitat types identified and used by these species in Segment 3 include shrublands and forests/woodlands, primarily used by mule deer and elk, and cliffs and talus areas and grasslands, used by bighorn sheep. Designated habitat types that are crossed by routes in Segment 3 include winter range for elk and mule deer, as well as a small amount of bighorn sheep Oregon occupied range; locations of big game habitat crossed by the B2H Project are described by alternative route below and displayed in MV-10.

Segment 3 crosses four ODFW WMUs that include the Keating, Lookout Mountain, Sumpter, and Catherine Creek WMUs. In all four WMUs, mule deer populations are currently below management objectives (ODFW 2015b), and elk populations are currently above management objectives (ODFW 2015c). Factors that can affect mule deer and elk populations in the B2H Project area are the same as those described for Segment 1. Bighorn sheep populations in Segment 3 are part of the Burnt River herd. As of 2003, the Burnt River herd population status was considered stable (ODFW 2003c). Factors that can negatively affect bighorn sheep populations in Oregon include lack of water, habitat loss, predation, and habitat degradation due to noxious weed establishment and fire suppression that has allowed encroachment of woody vegetation into the open habitat preferred by bighorn sheep (ODFW 2003c).

Table 3-155 presents the miles of big game habitat types crossed by the centerline of all alternative routes and route variations in Segment 3.

Table 3-155. Big Game Inventory Data for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Bighorn Sheep Oregon Occupied Range	Mule Deer Winter Range	Elk Winter Range
Applicant's Proposed Action	55.2	0.0	26.0	1.7
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.7*	*0.0*
Variation S3-B2	*14.4*	*0.0*	*4.3*	*0.0*
Variation S3-B3	*14.7*	*0.0*	*4.6*	*0.0*
Variation S3-B4	*14.3*	*0.0*	*4.6*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*4.3*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*17.5*	*1.7*
Variation S3-C2	*21.7*	*0.0*	*18.7*	*1.7*
Variation S3-C3	*21.1*	*0.0*	*21.0*	*4.9*
Variation S3-C4	*21.4*	*0.0*	*21.3*	*4.9*
Variation S3-C5	*21.0*	*0.8*	*21.0*	*10.0*
Variation S3-C6	*24.7*	*1.3*	*24.7*	*17.1*
Flagstaff A	55.3	0.0	29.6	1.7
Timber Canyon	70.3	0.0	37.1	43.1
Flagstaff A – Burnt River Mountain	55.3	0.0	33.2	4.9
Flagstaff B	56.0	0.0	29.9	1.7
Flagstaff B – Burnt River West	55.7	0.8	33.4	10.0
Flagstaff B – Durkee	59.6	1.3	37.1	17.1

Table Note: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.

Applicant's Proposed Action Alternative

Most of the southern half of the Applicant's Proposed Action Alternative crosses mule deer winter range, but only a small portion of the southern end of the route crosses elk winter range (Link 3-92). The Applicant's Proposed Action Alternative does not cross designated bighorn sheep habitat.

Variations S3-A1 and S3-A2

The variations do not cross designated big game habitat.

Variation S3-B1

A small portion of mule deer winter range is crossed at the southern end of the variation (Link 3-28). The variation does not cross elk winter habitat or designated bighorn sheep habitat.

Variations S3-B2, S3-B3, S3-B4, and S3-B5

Portions of the southern end of the variations cross mule deer winter range (Links 3-44, 3-47, and 3-48). The variations do not cross elk winter range or designated bighorn sheep habitat.

Variations S3-C1 and S3-C2

The entire lengths of the variations cross mule deer winter range, except for a small central portion of the variations (Link 3-78). A small portion of the southern end of the variations crosses elk winter range (Link 3-92). The variations do not cross designated bighorn sheep habitat.

Variation S3-C3 and S3-C4

The entire lengths of the variations cross mule deer winter range and the southern half of the variations cross elk winter range. The variations do not cross designated bighorn sheep habitat.

Variation S3-C5

The entire length of the variation crosses mule deer winter range and the southern half of the variation crosses elk winter range. A small portion of bighorn sheep Oregon occupied range is crossed near the northern end of the variation (Link 3-74).

Variation S3-C6

The entire length of the variation crosses mule deer winter range and most of the variation crosses elk winter range. A small portion of bighorn sheep Oregon occupied range is crossed near the northern end of the variation (Link 3-72).

Flagstaff A Alternative

Most of the southern half of the Flagstaff A Alternative crosses mule deer winter range, but only a small portion of the southern end of the route crosses elk winter range (Link 3-92). The Flagstaff A Alternative does not cross designated bighorn sheep habitat.

Timber Canyon Alternative

The Timber Canyon Alternative crosses elk winter range and mule deer winter range throughout Segment 3. The alternative route does not cross designated bighorn sheep habitat.

Flagstaff A – Burnt River Mountain Alternative

Most of the southern half of the Flagstaff A – Burnt River Mountain Alternative crosses mule deer winter range, but only a small portion of the southern end of the route crosses elk winter range (Link 3-92). The Flagstaff A – Burnt River Mountain Alternative does not cross designated bighorn sheep habitat.

Flagstaff B Alternative

Most of the southern half of the Flagstaff B Alternative crosses mule deer winter range. Elk winter range crossed by the Flagstaff A Alternative is the same as that described for the Applicant's Proposed Action Alternative. The Flagstaff B Alternative does not cross designated bighorn sheep habitat.

Flagstaff B – Burnt River West Alternative

Most of the southern half of the Flagstaff B – Burnt River West Alternative crosses mule deer winter range, but only a small portion of the southern end of the route crosses elk winter range (Link 3-73). The Flagstaff B – Burnt River West Alternative crosses a small portion of bighorn sheep Oregon occupied range west of Durkee (Link 3-71).

Flagstaff B – Durkee Alternative

Most of the southern half of the Flagstaff B – Durkee Alternative crosses mule deer winter range, but only a small portion of the southern end of the route crosses elk winter range (Links 3-74 and 3-90). The Flagstaff B – Durkee Alternative crosses a small portion of bighorn sheep Oregon occupied range west of Durkee (Link 3-71).

Management Indicator Species and USFS Sensitive Species

Alternative Routes and Route Variations

The Timber Canyon Alternative is the only route that crosses national forest land in Segment 3 (Link 3-6). The affected environment for MIS and USFS sensitive species is described in Appendix F.

SEGMENT 4—BROGAN

Wildlife Habitat

Alternative Routes and Route Variations

Shrublands comprise the majority of wildlife habitats in Segment 4 (MV-7, Table 3-110 in Section 3.2.3). Shrubland habitat is evenly distributed throughout Segment 4. Limited grassland habitat and RCAs also are present scattered throughout Segment 4. Small acreages of bare ground/cliff/talus habitat are present, with the majority concentrated in the southwestern portion of Segment 4. Table E-2 (Appendix E) describes wildlife species commonly found in the wildlife habitats present in Segment 4.

Special Status Species

Alternative Routes and Route Variations

Thirty special status species may occur, are likely to occur, or are known to occur in Segment 4 (Table 3-142). Information relating to the types of habitat available for special status species within the study corridor is located in Table 3-110 in Section 3.2.3. Habitat locations are depicted in MV-7. Special status species in Segment 4 include shrubland species, such as common nighthawk, pallid bat, burrowing owl, and white-tailed jackrabbit; grassland species, such as bobolink and long-billed curlew; and species that occur in RCAs, including northern leopard frog, Woodhouse's toad, and western ridged mussel. Threats to these species have been discussed in previous segments. Species accounts for these species, and others that may occur in this segment, as identified in Table 3-142, are discussed in Appendix E.

Greater Sage-Grouse

Segment 4 crosses through areas mapped for the Northern Great Basin population, a large Greater Sage-Grouse population found in Oregon, Idaho, Nevada, and Utah. The population is divided into two segments, with the largest portion located in Oregon, Idaho, and Nevada and the smaller portion located in northwestern Utah, known as the Box Elder area. This population occurs on a large amount of publicly managed land (largely BLM), and that is among the least fragmented and largest sagebrush-dominated landscapes within the extant range of Greater Sage-Grouse (USFWS 2013). In 2007, this population was estimated to have a minimum of 9,114 males (Garton et al. 2011).

Loss of sagebrush habitat has been and continues to be a threat to the Northern Great Basin population in Oregon. Between 1963 and 1974, 500,000 acres of sagebrush habitat was seeded to crested wheatgrass or sprayed with herbicide, and 1,600 water developments and 463 miles of pipeline were constructed in the BLM Vale District (USFWS 2013). More recently, wildfire has been the largest threat to landscape-scale losses of sagebrush habitat. Large wildfires that have burned Greater Sage-Grouse habitat in the study corridor include the 80,054-acre Jackson Fire (2000), the 4,104-acre Cavanaugh 2 Fire (2001), the 4,302-acre Farewell Bend Fire (2005),14,632-acre Mud Springs Fire (2006), the 22,700-acre Kitten Fire Complex (2014), and the 12,024-acre Lime Hill Fire (2015) (BLM n.d.; USGS 2016). In conjunction with fire, invasive weeds also are one of the greatest risks to the more than 4 million acres of sagebrush habitat for this population in Oregon. More than 580,000 acres is dominated by invasive species (Hagen 2011). Other threats in this region include mining development, renewable energy development, transmission lines, and juniper encroachment at higher elevations. West Nile virus also has been detected in mosquitoes in this region (Oregon Public Health Division 2014) and the population was subjected to the largest known West Nile virus mortality event involving Greater Sage-Grouse in Oregon. Despite efforts to manage wildfire risks, wildfires and invasive species have continued to reduce the quality of habitat in portions of Segment 4. Due to existing landscape features, this northwestern portion of the population is at higher risk from landscape altering events such as high intensity wildfire (USFWS 2013).

The Cow Valley Oregon PAC is present in Segment 4 and is the northern-most concentration of Greater Sage-Grouse in the Northern Great Basin population. Based on ILAP data (Gaines et al. 2013), 83.2 percent (300,608 acres) of the 368,615 acre Cow Valley Oregon PAC is comprised of existing Greater Sage-Grouse habitat and 16.8 percent (60,826 acres) is potential Greater Sage-Grouse habitat. Potential habitat consists of areas that are capable of supporting sagebrush but not currently suitable for Greater Sage-Grouse and include burned areas, agricultural land, areas encroached by junipers, and crested wheat plantings.

There are at least 38 leks or lek complexes within the Cow Valley Oregon PAC. Since 1998, lek surveys have been conducted annually at three of these that are in proximity to the B2H Project: Becker Creek, Worthington, and County Border Number 2. The spring trend for maximum attendance per lek (moving 5-year average) was 28 Greater Sage-Grouse in 2014 which is 65 percent above the 2003 baseline of 16 Greater Sage-Grouse. Greater Sage-Grouse have not been observed at the Becker Creek lek complex in the last 4 years. Attendance at the Worthington lek complex is relatively low (12 Greater Sage-Grouse in 2014), but has increased 63 percent from the 2003 baseline. The County Border Number 2 lek has the highest attendance (42 sage-grouse in 2014) compared to the other lek complexes, has increased 79 percent from the 2003 baseline.

Greater Sage-Grouse may disperse between the Cow Valley Oregon PAC and other Oregon PACs. Dispersal is most likely to occur with the adjacent Bully Creek Oregon PAC located to the south. Dispersal also is possible between the Cow Valley Oregon PAC and the Drewsey and Crowley Oregon PACs, as connectivity is not severely limited.

Table 3-156 presents the miles of Greater Sage-Grouse habitat types crossed by the centerline of all alternative routes and route variations in Segment 4. Locations of Greater Sage-Grouse habitat crossed by the B2H Project are described by alternative route below and displayed in MV-8.

Table 3-156. Alternative Route Comparison for Greater Sage-Grouse Inventory Data for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Priority Habitat Management Areas	General Habitat Management Areas
Applicant's Proposed Action	40.1	20.3	18.7
Variation S4-A1	*5.9*	*0.0*	*4.8*
Variation S4-A2	*6.0*	*0.0*	*4.8*
Variation S4-A3	*6.1*	*0.0*	*4.8*
Tub Mountain South	40.5	6.8	10.2
Willow Creek	34.6	15.5	14.5
Table Note: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.			

The number and occupancy status of leks within 0.25, 2.0, and 3.1 miles of the centerlines of the alternative routes and route variations are presented in Table 3-157. The proximity of leks to the alternative routes and route variations is discussed by route below. The lek occupancy status classifications are defined in Section 3.2.4.2 under Greater Sage-Grouse Policy and Management Guidance – Oregon Department of Fish and Wildlife Plans.

Table 3-157. Number of Greater Sage-Grouse Leks in Segment 4—Brogan

Alternative Route	Lek Occupancy Status	Number of Leks within 0.25, 2.0, and 3.1 Miles					
		Priority Habitat Management Areas			General Habitat Management Areas		
		0.25	2.0	3.1	0.25	2.0	3.1
Applicant's Proposed Action	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	0	2	0	0	0
	Occupied	0	0	0	0	0	0
	Occupied pending	0	1	10	0	0	1
	Historic	0	0	1	0	0	0
	Unknown	0	0	0	0	0	0
Variation S4-A1	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*1*	*0*	*0*	*0*
	Unknown	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*1*	*0*	*0*	*0*
	Unknown	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-157. Number of Greater Sage-Grouse Leks in Segment 4—Brogan							
Alternative Route	**Lek Occupancy Status**	**Number of Leks within 0.25, 2.0, and 3.1 Miles**					
		Priority Habitat Management Areas			**General Habitat** Management Areas		
		0.25	**2.0**	**3.1**	**0.25**	**2.0**	**3.1**
Variation S4-A3	*Unoccupied*	*0*	*0*	*0*	*0*	*0*	*0*
	Unoccupied pending	*0*	*0*	*1*	*0*	*0*	*0*
	Occupied	*0*	*0*	*0*	*0*	*0*	*0*
	Occupied pending	*0*	*0*	*0*	*0*	*0*	*0*
	Historic	*0*	*0*	*1*	*0*	*0*	*0*
	Unknown	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	0	1	0	0	0
	Occupied	0	0	0	0	0	0
	Occupied pending	0	1	1	0	0	0
	Historic	0	0	1	0	0	0
	Unknown	0	0	0	0	0	0
Willow Creek	Unoccupied	0	0	0	0	0	0
	Unoccupied pending	0	0	1	0	0	0
	Occupied	0	0	0	0	0	0
	Occupied pending	0	2	8	0	0	1
	Historic	0	0	1	0	0	0
	Unknown	0	0	0	0	0	0

Applicant's Proposed Action Alternative

Except for a very small portion at the northern end of the route, the entire length of the Applicant's Proposed Action Alternative crosses Greater Sage-Grouse habitat, with approximately half of the route crossing PHMA in the Cow Valley Oregon PAC (Links 4-25, 4-45, 4-50, and 4-65) and approximately half the route crossing GHMA (Links 4-13, 4-65, and 4-70). The Applicant's Proposed Action Alternative also is within 3.1 miles of occupied pending, unoccupied pending, and historic leks; however, no leks are closer than 0.25 mile.

Variations S4-A1, S4-A2, and S4-A3

Except for a very small portion at the northern end of the route, the entire lengths of the variations cross Greater Sage-Grouse GHMA. The entire length of Variation S4-A2 is colocated with an existing transmission line. The variations also are 3.1 miles of unoccupied pending and historic leks; however, no leks are closer than 2.0 miles. The variations do not cross PHMA.

Tub Mountain South Alternative

Northern portions of the Tub Mountain South Alternative cross GHMA (Link 4-15) and PHMA in the Cow Valley PAC (Link 4-30) and southern portions cross GHMA (Link 4-75); a large central portion of the alternative route (Link 4-75), along with smaller portions of the northern and southern sections, does not cross Greater Sage-Grouse habitat. The route also is 3.1 miles of occupied pending, unoccupied pending, and historic leks; however, no leks are closer than 0.25 mile.

Willow Creek Alternative

Except for several small portions of the route, the entire length of the Willow Creek Alternative crosses Greater Sage-Grouse habitat, with GHMA (Link 4-13) and PHMA in the Cow Valley PAC (Links 4-25, 4-35, 4-40, and 4-60) crossed in the northern half and GHMA crossed in the southern half (Links 4-60 and 4-70). The route also is 3.1 miles of occupied pending, unoccupied pending, and historic leks; however, no leks are closer than 0.25 mile.

Migratory Birds Including Raptors

Segment 4 is in the migratory bird Pacific Flyway and contains habitats that support many avian species identified as BCCs within BCR 9 (Table 3-143). These habitats also provide nesting and foraging areas for a variety of raptors (Table 3-144). Habitat for shrubland species (e.g., Brewer's sparrow and sage thrasher), and, to a lesser extent, grassland species (e.g., long-billed curlew), and species that occur in RCAs (e.g., willow flycatcher), is present in the study corridor in Segment 4 (Table 3-110 in Section 3.2.3 and MV-7). A detailed discussion of available wildlife habitats within the study corridor in Segment 4 is presented in Vegetation Resources, Section 3.2.3.

The shrublands and grasslands in Segment 4 provide hunting and breeding habitat for golden eagles, and forested areas near waterbodies in the B2H Project area are suitable for bald eagle use; locations of known eagle nests in the study corridor are presented in Table 3-158 and described by alternative route and route variation below.

Table 3-158. Number of Eagle Nests in Segment 4—Brogan

Alternative Route	Bald Eagle		Golden Eagle	
	1-Mile Corridor	10-Mile Corridor	1-Mile Corridor	10-Mile Corridor
Applicant's Proposed Action	0	2	6	50
Variation S4-A1	*0*	*0*	*2*	*19*
Variation S4-A2	*0*	*0*	*4*	*19*
Variation S4-A3	*0*	*0*	*2*	*19*
Tub Mountain South	0	5	4	37
Willow Creek	0	4	4	39

Applicant's Proposed Action Alternative

Throughout Segment 4, the Applicant's Proposed Action Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the Applicant's Proposed Action Alternative crosses habitat for species found in RCAs, such as willow flycatcher, and grassland species, such as long-billed curlew. The Applicant's Proposed Action Alternative is within 5 miles of bald and golden eagle nests throughout Segment 4; however, no bald eagle nests are closer than 0.5 mile.

Variations S4-A1, S4-A2, and S4-A3

The variations cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher; species that occur in RCAs, such as willow flycatcher; and grassland species, such as long-billed curlew. The entire length of Variation S4-A2 is colocated with an existing transmission line. No bald

eagle nests are known within 5 miles of the variations, but the variations are within 0.5 mile of golden eagle nests.

Tub Mountain South Alternative

The Tub Mountain South Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher; grassland species, such as long-billed curlew; and, to a lesser extent, species found in RCAs, such as willow flycatcher. The Tub Mountain South Alternative is within 5 miles of bald and golden eagle nests throughout Segment 4; however, no bald eagle nests are closer than 0.5 mile.

Willow Creek Alternative

Throughout Segment 4, the Willow Creek Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the Willow Creek Alternative crosses habitat for species found in RCAs, such as willow flycatcher, and grassland species, such as long-billed curlew. The Willow Creek Alternative is within 5 miles of bald and golden eagle nests throughout Segment 4; however, no bald eagle nests are closer than 0.5 mile.

Big Game

Big game species present in the B2H Project area for Segment 4 include mule deer, white-tailed deer, elk, and pronghorn. Major habitat types identified and used by these species in Segment 4 include shrublands and grasslands. Designated habitat types that are crossed by routes in Segment 4 include winter range for elk, mule deer, and pronghorn; locations of big game habitat crossed by the B2H Project are described by alternative route and route variation below and displayed in MV-10.

Segment 4 crosses two ODFW WMU that include the Sumpter and Beulah WMUs. In both WMUs, mule deer populations are currently below management objectives (ODFW 2015b, 2015c). Elk populations are currently above management objectives in the Sumpter WMU. The East Beulah WMU is considered an elk de-emphasized area (ODFW 2015c). Elk de-emphasis areas are characterized by high percentages of private land with ongoing elk damage to private property and agricultural crops, or high potential for such damage. Management objectives are not proposed for these areas, and the management focus is to minimize elk numbers and damage caused by elk (ODFW 2005). Population estimates for elk in the West Beulah WMU were not available for 2015, but estimates for 2010-2014 were below management objectives. Factors that can affect mule deer and elk populations in the B2H Project area are the same as those described for Segment 1. Factors affecting populations and management objectives for pronghorn in the B2H Project area were not available.

Table 3-159 presents the miles of big game habitat types crossed by the centerline of all alternative routes and route variations in Segment 4.

Table 3-159. Big Game Inventory Data for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range
Applicant's Proposed Action	40.1	0.0	26.0	35.4
Variation S4-A1	*5.9*	*0.0*	*5.9*	*5.9*
Variation S4-A2	*6.0*	*0.0*	*5.9*	*5.9*
Variation S4-A3	*6.1*	*0.0*	*6.0*	*6.0*
Tub Mountain South	40.5	13.1	37.0	24.1
Willow Creek	34.6	2.9	29.5	25.5

Table Notes: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.

Applicant's Proposed Action Alternative

Applicant's Proposed Action Alternative crosses mule deer and/or elk winter range throughout Segment 4. The Applicant's Proposed Action Alternative does not cross pronghorn winter range.

Variations S4-A1, S4-A2, and S4-A3

The entire length the variations cross both elk and mule deer winter range. The entire length of Variation S4-A2 is colocated with an existing transmission line. The variations do not cross pronghorn winter range.

Tub Mountain South Alternative

Except for a small potion near the southern end of the alternative route (Link 4-75), all of the Tub Mountain South Alternative crosses mule deer and/or elk winter range in Segment 4. The Tub Mountain South Alternative also crosses three blocks of pronghorn winter range (Link 4-75).

Willow Creek Alternative

Except for a small potion (Link 4-60), all of the Willow Creek Alternative crosses mule deer and/or winter range in Segment 4. A small portion of the alternative route also crosses pronghorn winter range (Links 4-35, 4-40, and 4-60).

SEGMENT 5—MALHEUR

Wildlife Habitat

Alternative Routes and Route Variations

Shrublands comprise the majority of wildlife habitats in Segment 5 (MV-7, Table 3-113 in Section 3.2.3). Shrubland habitat is evenly distributed throughout Segment 5. Limited grassland habitat and RCAs also are present scattered throughout Segment 5. Small acreages of bare ground/cliff/talus habitat also are present. Additionally, the alternative routes and Variations S5-B1 and S5-B2 cross shrublands, grasslands, and RCAs at the Owyhee River Below the Dam ACEC along the Owyhee River (Links 5-30, 5-35, 5-50, and 5-55); the diverse habitat of this area supports a large number of wildlife

species, including migrating birds. Refer to Table E-2 (Appendix E) for a list of the wildlife species commonly found in each wildlife habitat type in Segment 5.

Special Status Species

Alternative Routes and Route Variations

Thirty-five special status species may occur, are likely to occur, or are known to occur in Segment 5 (Table 3-142). Information relating to the types of habitat available for special status species within the study corridor is located in Table 3-113 in Section 3.2.3. Habitat locations are depicted in MV-7. Special status species in Segment 4 include shrubland species such as common nighthawk, pallid bat, and white-tailed jackrabbit; grassland species such as bobolink and long-billed curlew; and species that occur in RCAs such as northern leopard frog and Woodhouse's toad. Threats to these species have been discussed in previous segments. Species accounts for these species, and others that may occur in this segment, as identified in Table 3-142, are discussed in Appendix E.

Columbia Spotted Frog

Habitat for the Columbia spotted frog Greater Basin distinct population segment is crossed in Segment 5. Table 3-160 presents the miles of Columbia spotted frog habitat crossed by the centerline of all alternative routes and route variations in Segment 5. Locations of Columbia spotted frog habitat crossed by the B2H Project are described by alternative route and route variation below and displayed in MV-8. Refer to the Occurrence subsection of Columbia spotted frog at the beginning of Section 3.2.4.5 for definitions of habitat types.

Table 3-160. Columbia Spotted Frog Inventory Data for Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Potentially Occupied Habitat (Higher Quality)	Suitable Habitat (High Potential)
Applicant's Proposed Action	40.4	0.0	1.8
Variation S5-A1	*7.4*	*0.0*	*0.5*
Variation S5-A2	*7.4*	*0.1*	*0.6*
Variation S5-B1	*2.5*	*0.0*	*0.7*
Variation S5-B2	*2.8*	*0.0*	*0.8*
Malheur S	43.5	0.9	2.0
Malheur A	43.1	0.9	2.0
Table Notes: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.			

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses small portions of Columbia spotted frog suitable habitat (high potential) throughout Segment 5. The route does not cross any other Columbia spotted frog habitat types in Segment 5.

Variation S5-A1

The variation crosses four small areas of Columbia spotted frog suitable habitat (high potential) (Link 5-15). Potentially occupied habitat (higher quality) occurs within the study corridor near the variation's

northern end but is not crossed. The variation does not cross any other Columbia spotted frog habitat types in Segment 5.

Variation S5-A2

The variation crosses four small areas of Columbia spotted frog suitable habitat (high potential) (Link 5-20). The variation also crosses potentially occupied habitat (higher quality) near the variation's northern end. The variation does not cross any other Columbia spotted frog habitat types in Segment 5.

Variations S5-B1 and S5-B2

The variations cross small portions of Columbia spotted frog suitable habitat (high potential) throughout the length of the variations. The variations do not cross any other Columbia spotted frog habitat types in Segment 5.

Malheur S and Malheur A Alternatives

The Malheur S and Malheur A Alternatives cross small areas of Columbia spotted frog suitable habitat (high potential) throughout the southern half of Segment 5 (Links 5-25, 5-30, and 5-35). The alternative routes also cross areas of potentially occupied habitat (higher quality) in the northern half of Segment 5 (Link 5-25). The alternative routes do not cross any other Columbia spotted frog habitat types in Segment 5.

Greater Sage-Grouse

Segment 5 crosses habitat for the Greater Sage-Grouse Northern Great Basin population. This population was estimated, in 2007, to have a minimum of 9,114 males (Garton et al. 2011). The Northern Great Basin population occupies portions of Oregon, Nevada, Idaho, and Utah, and is separated from adjacent populations by distance (12 to 37 miles) and topography. Current threats and trends in habitat loss and fragmentation for the Northern Great Basin Greater Sage-Grouse population have been discussed previously in Segment 4.

As discussed for Segments 3 and 4, wildfire has been one of the largest threats to Greater Sage-Grouse habitat loss. Numerous large wildfires have affected areas of Greater Sage-Grouse habitat in the study corridor in Segment 5, including the 22,112-acre Double Mountain Fire (2005), the 31,320-acre Cow Hollow Fire (1996), and the 46,511-acre Owyhee Fire (2013) (BLM n.d.; USGS 2016). Wildfires affecting Greater Sage-Grouse habitat in Segment 5 in the B2H Project area are discussed further in cumulative effects analysis (Section 3.3.3.4).

The B2H Project crosses Greater Sage-Grouse GHMA in Segment 5; no PHMA or leks occur with the study corridor of the alternative routes and route variations. Table 3-161 presents the miles of Greater Sage-Grouse habitat types crossed by the centerline of all alternative routes and route variations in Segment 5. Locations of Greater Sage-Grouse habitat crossed by the B2H Project are described by alternative route and route variation below and displayed in MV-9.

Table 3-161. Greater Sage-Grouse Inventory Data for Segment 5—Malheur (miles crossed)			
Alternative Route	**Total Length (miles)**	**Priority Habitat Management Areas**	**General Habitat Management Areas**
Applicant's Proposed Action	40.4	0.0	11.2
Variation S5-A1	*7.4*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.2*
Variation S5-B2	*2.8*	*0.0*	*1.1*
Malheur S	43.5	0.0	22.4
Malheur A	43.1	0.0	25.6
Table Notes: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.			

Applicant's Proposed Action Alternative

The northern end and central portions of the Applicant's Proposed Action Alternative cross blocks of Greater Sage-Grouse GHMA (Links 5-1, 5-5, 5-40, and 5-45). The Applicant's Proposed Action Alternative does not cross PHMA and no leks are closer than 3.1 miles.

Variations S5-A1 and S5-A2

The variations do not cross Greater Sage-Grouse PHMA or GHMA and no leks are closer than 3.1 miles.

Variation S5-B1

A small portion of the variation crosses Greater Sage-Grouse GHMA at the variation's north end (Link 5-50). The variation does not cross PHMA and no leks are closer than 3.1 miles.

Variation S5-B2

The majority of the northern half of the variation crosses Greater Sage-Grouse GHMA (Link 5-5-45). The variation does not cross PHMA and no leks are closer than 3.1 miles.

Malheur S and Malheur A Alternatives

The Malheur S and Malheur A Alternatives cross Greater Sage-Grouse GHMA throughout Segment 5 (Links 5-1, 5-5, 5-25, 5-30, and 5-35). The alternative routes do not cross PHMA and no leks are closer than 3.1 miles.

Migratory Birds Including Raptors

Segment 5 is in the migratory bird Pacific Flyway and contains habitats that support many avian species identified as BCCs within BCR 9 (Table 3-143). These habitats also provide nesting and foraging areas for a variety of raptors (Table 3-144). Habitat for shrubland species (e.g., Brewer's sparrow and sage thrasher), and, to a lesser extent, grassland species (e.g., long-billed curlew), and species that occur in RCAs (e.g., willow flycatcher), is present in the study corridor in Segment 5 (Table 3-113 in Section 3.2.3 and MV-7). A detailed discussion of available wildlife habitats within the study corridor in Segment 5 is presented in Vegetation Resources, Section 3.2.3.

The shrublands and grasslands in Segment 5 provide hunting and breeding habitat for golden eagles, and waterbodies and adjacent habitat in the B2H Project area are suitable for bald eagle use; locations of known eagle nests in the study corridor are presented in Table 3-162 and described by alternative route and route variation below.

Table 3-162. Number of Eagle Nests in Segment 5—Malheur

Alternative Route	Bald Eagle		Golden Eagle	
	1-Mile Corridor	10-Mile Corridor	1-Mile Corridor	10-Mile Corridor
Applicant's Proposed Action	0	2	11	64
Variation S5-A1	*0*	*0*	*0*	*10*
Variation S5-A2	*0*	*0*	*0*	*12*
Variation S5-B1	*0*	*0*	*1*	*32*
Variation S5-B2	*0*	*0*	*1*	*32*
Malheur S	0	3	20	88
Malheur A	0	3	16	81

Applicant's Proposed Action Alternative

Throughout Segment 5, the Applicant's Proposed Action Alternative crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the Applicant's Proposed Action Alternative crosses habitat for species found in RCAs, such as willow flycatcher, and grassland species, such as long-billed curlew. The Applicant's Proposed Action Alternative is within 5 miles of bald and golden eagle nests throughout Segment 5; however, no bald eagle nests are closer than 0.5 mile.

Variations S5-A1 and S5-A2

Variations S5-A1 and S5-A2 cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher; species that occur in RCAs, such as willow flycatcher; and grassland species, such as long-billed curlew. No bald eagle nests are known within 5 miles of the variations and no golden eagle nests are closer than 0.5 mile.

Variations S5-B1 and S5-B2

Variation S5-B1 and S5-B2 cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and species that occur in RCAs, such as willow flycatcher. No bald eagle nests are known within 5 miles, but the variations are within 5 miles of golden eagle nests.

Malheur S and Malheur A Alternatives

Throughout Segment 5, the Malheur S Alternative and Malheur A Alternatives cross habitat for shrubland species such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the alternative routes cross habitat for species found in RCAs such as willow flycatcher, and grassland species such as long-billed curlew. The Malheur S and Malheur B Alternatives are within 5 miles of bald and golden eagle nests throughout Segment 5; however, no bald eagle nests are closer than 0.5 mile.

Big Game

Big game species present in the B2H Project area for Segment 5 include mule deer, elk, and pronghorn. Designated habitat types that are crossed by routes in Segment 5 include winter range for elk, mule deer, and pronghorn; locations of big game habitat crossed by the B2H Project are described by alternative route and route variation below and displayed in MV-10.

Table 3-163 presents the miles of big game habitat types crossed by the centerline of all alternative routes and route variations in Segment 5.

Table 3-163. Big Game Inventory Data for Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range
Applicant's Proposed Action	40.4	12.8	24.6	2.2
Variation S5-A1	*7.4*	*5.5*	*1.3*	*0.0*
Variation S5-A2	*7.4*	*6.0*	*0.2*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*2.5*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*2.8*	*0.0*
Malheur S	43.5	14.7	20.6	2.2
Malheur A	43.1	16.4	20.0	2.2

Table Notes: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.

Segment 5 crosses two ODFW WMU that include the Beulah and Owyhee WMUs. In both WMUs, mule deer populations are currently below management objectives (ODFW 2015b). Elk populations are currently above management objectives in the Owyhee WMU (ODFW 2015c). The East Beulah WMU is considered an elk de-emphasized area (ODFW 2015c). Elk de-emphasis areas are characterized by high percentages of private land with ongoing elk damage to private property and agricultural crops, or high potential for such damage. Management objectives are not proposed for these areas, and the management focus is to minimize elk numbers and damage caused by elk (ODFW 2005). Population estimates for elk in the West Beulah WMU were not available for 2015, but estimates for 2010-2014 were below management objectives. Factors that can affect mule deer and elk populations in the B2H Project area are the same as those described for Segment 1. Factors affecting populations and management objectives for pronghorn in the B2H Project area were not available.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses two large blocks of mule deer winter range in the northern and southern halves of Segment 5 (Links 5-5, 5-10, 5-40, 5-50, 5-55, 5-65, and 5-70) and pronghorn winter range in central and northern portions of the routes (Links 5-1, 5-5, 5-15, and 5-40). The Applicant's Proposed Action Alternative only crosses a small area of elk winter range at the northern end of the route.

Variations S5-A1 and S5-A2

The majority of the variations cross pronghorn winter range, but only small portions cross mule deer winter range (Links 5-15 and 5-20). The variations do not cross elk winter range.

Variation S5-B1

The entire length of the route variation crosses mule deer winter range. The variations do not cross mule deer or elk winter range.

Variation S5-B2

The entire length of the route variation crosses mule deer winter range. The variation does not cross mule deer or elk winter range.

Malheur S and Malheur A Alternatives

Northern and southern portions of the Malheur S and Malheur A Alternatives cross mule deer winter range and the alternative routes cross blocks of pronghorn winter range in Segment 5. The alternative routes only cross a small area of elk winter range at the northern end of Segment 5.

SEGMENT 6—TREASURE VALLEY

Wildlife Habitat

Alternative Routes and Route Variations

Shrublands comprise the majority of habitat in Segment 6 (MV-7, Table 3-116 in Section 3.2.3). Limited RCAs are scattered throughout Segment 6. Grasslands also are present, but the majority of the grasslands are composed of non-native grass species. Refer to Table E-2 (Appendix E) for a list of the wildlife species commonly found in each wildlife habitat type in Segment 6.

Special Status Species

Alternative Routes and Route Variations

Fifty-four special status species may occur, are likely to occur, or are known to occur in Segment 6 (Table 3-142). Information relating to the types of habitat available for special status species within the study corridor is located in Table 3-116 in Section 3.2.3. Habitat locations are depicted in MV-7. Special status species in Segment 6 include shrubland species such as pallid bat and Greater Sage-Grouse (discussed in detail below) and species that occur in RCAs such as northern leopard frog and Woodhouse's toad; the majority of grassland habitat present is composed of non-native grasses and is unlikely to support special status grassland species. Threats to these special status species have been discussed in previous segments. Species accounts for these species, and others that may occur in this segment, as identified in Table 3-142, are discussed in Appendix E.

Columbia Spotted Frog

The only Columbia spotted frog (Greater Basin distinct population segment) habitat type crossed in Segment 6 is suitable habitat (high potential). Table 3-164 presents the miles of Columbia spotted frog habitat crossed by the centerline of the Applicant's Proposed Action and route variations in Segment 6. Locations of Columbia spotted frog habitat crossed by the B2H Project are described by alternative route and route variation below and displayed in MV-8. Refer to the Occurrence subsection of Columbia spotted frog at the beginning of Section 3.2.4.5 for definitions of habitat types.

Table 3-164. Columbia Spotted Frog Inventory Data for Segment 6—Treasure Valley (miles crossed)		
Alternative Route	**Total Length (miles)**	**Suitable Habitat (High Potential)**
Applicant's Proposed Action	28.0	2.1
Variation S6-A1	*9.3*	*1.0*
Variation S6-A2	*8.9*	*0.3*
Variation S6-B1	*14.4*	*0.7*
Variation S6-B2	*14.1*	*0.5*
Table Note: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.		

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses small portions of Columbia spotted frog suitable habitat (high potential) throughout Segment 6. The route does not cross any other Columbia spotted frog habitat types in Segment 6.

Variations S6-A1 and S6-A2

Variations S6-A1 and S6-A2 cross several small portions of Columbia spotted frog suitable habitat (high potential) (Links 6-5, 6-10, 6-15, 6-20). The variations do not cross any other Columbia spotted frog habitat types in Segment 6.

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B2 cross several small portions of Columbia spotted frog suitable habitat (high potential) (Links 6-25 and 6-30). The variations do not cross any other Columbia spotted frog habitat types in Segment 6.

Greater Sage-Grouse

As with Segments 4 and 5, Segment 6 crosses the Northern Great Basin Greater Sage-Grouse population; population estimates and trends in habitat loss and fragmentation have been discussed previously.

Despite efforts to manage wildfire risks, wildfires have continued to reduce the quality of Greater Sage-Grouse habitat in Segment 6. Idaho's Murphy Fire Complex of 2007 affected roughly 600,000 acres of habitat for this population. Large wildfires that have affected areas of Greater Sage-Grouse habitat in the study corridor include the 260,182-acre Soda Fire of 2015 and the 42,688-acre Trimbly Fire of 2002. Wildfires affecting Greater Sage-Grouse habitat in Segment 6 in the B2H Project area are discussed further in the cumulative effects analysis (Section 3.3.3.4).

The B2H Project crosses IHMA, but not PHMA or GHMA, in Segment 6. However, some portions of IHMA consist of lands that serve as management buffers between developed areas and PHMA and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy (Makela and Major 2012). No leks occur in the study corridor of Applicant's Proposed Action and route variations. Table 3-165 presents the miles of Greater Sage-Grouse habitat types crossed by the centerline of the Applicant's Proposed Action and route variations in Segment 6. Locations of

Greater Sage-Grouse habitat crossed by the B2H Project are described by alternative route and route variation below and displayed in MV-9.

Table 3-165. Greater Sage-Grouse Inventory Data for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Priority Habitat Management Areas	Important Habitat Management Areas[1]	General Habitat Management Areas
Applicant's Proposed Action	28.0	0.0	22.3	0.0
Variation S6-A1	*9.3*	*0.0*	*6.7*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*5.9*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*13.5*	*0.0*
Variation S6-B2	*14.1*	*0.0*	*13.7*	*0.0*

Table Notes:
[1]Some portions of Important Habitat Management Areas consist of lands that serve as management buffers between developed areas and Priority Habitat Management Areas and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy.
Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action is adjacent to an existing 500-kV transmission line. The Applicant's Proposed Action crosses IHMA for the majority of Segment 6, but more than half of IHMA crossed (portions west of U.S. 95; Links 6-1, 6-20, and 6-25) are lands that serve as management buffers for PHMA and to connect patches of PHMA (refer to Greater Sage-Grouse Policy and Management Guidance in Section 3.2.4.2 for the definition of IHMA), and are not identified as lands used by Greater Sage-Grouse (Makela and Major 2012). No leks, PHMA, or GHMA are in the study corridor of the Applicant's Proposed Action Alternative.

Variations S6-A1 and S6-A2

Variations S6-A1 and S6-A2 parallel an existing 500-kV transmission line (however, Variation S6-A2 is closer to the existing transmission line than Variation S6-A1) and the majority of the variations cross IHMA; however, the portions of IHMA crossed are not identified as lands used by Greater Sage-Grouse (Makela and Major 2012), but are lands that serve as management buffers for PHMA and to connect patches of PHMA (refer to Greater Sage-Grouse Policy and Management Guidance in Section 3.2.4.2 for the definition of IHMA). No leks, PHMA, or GHMA are in the study corridor of the variations.

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B2 parallel an existing 500-kV transmission line (however, Variation S6-B1 is closer to the existing transmission line than Variation S6-B2). Except for small portions in the western halves (Links 6-25 and 6-30), the entire lengths of both route variations cross IHMA, all of which is identified as land used by Greater Sage-Grouse.

Migratory Birds Including Raptors

Segment 6 is in the migratory bird Pacific Flyway and contains habitats that support many avian species identified as BCCs within BCR 9 (Table 3-143). These habitats also provide nesting and foraging areas for a variety of raptors (Table 3-144). Habitat for shrubland species (e.g., Brewer's sparrow and sage thrasher) and, to a lesser extent, species that occur in RCAs (e.g., willow flycatcher), is present in the study corridor in Segment 6 (MV-7 and Table 3-116 in Section 3.2.3). Non-native grasslands also are present in Segment 6 and may provide habitat for some migratory bird species, but are unlikely to support BCCs. A detailed discussion of available wildlife habitats within the study corridor in Segment 6 is presented in Vegetation Resources, Section 3.2.3.

The shrublands and grasslands in Segment 6 provide hunting and breeding habitat for golden eagles; bald eagles occur in Segment 6 but no nests are known within 5 miles. Table 3-166 and described by alternative route and route variation below.

Table 3-166. Number of Eagle Nests in Segment 6—Treasure Valley

Alternative Route	Bald Eagle		Golden Eagle	
	1-Mile Corridor	10-Mile Corridor	1-Mile Corridor	10-Mile Corridor
Applicant's Proposed Action	0	0	9	67
Variation S6-A1	*0*	*0*	*2*	*19*
Variation S6-A2	*0*	*0*	*0*	*19*
Variation S6-B1	*0*	*0*	*5*	*46*
Variation S6-B2	*0*	*0*	*2*	*46*

Applicant's Proposed Action Alternative

The Applicant's Proposed Action is adjacent to an existing 500-kV transmission line. Throughout Segment 6, the Applicant's Proposed Action crosses habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and, to a lesser extent, the Applicant's Proposed Action crosses habitat for species found in RCAs, such as willow flycatcher. The Applicant's Proposed Action is within 5 miles to golden eagle nests throughout Segment 6; however, no bald eagle nests are known within 5 miles.

Variations S6-A1 and S6-A2

Variations S6-A1 and S6-A2 parallel an existing 500-kV transmission line (however, Variation S6-A2 is closer to the existing transmission line than Variation S6-A1). Variations S6-A1 and S6-A2 cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and species that occur in RCAs, such as willow flycatcher. No bald eagle nests are known within 5 miles of the variations, but the variations are within 5 miles of golden eagle nests. Variation S6-A1, but not Variation S6-A1, is within 0.5 mile of golden eagle nests

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B2 parallel an existing 500-kV transmission line (however, Variation S6-B1 is closer to the existing transmission line than Variations S6-B2). Variations S6-B1 and S6-B2 cross habitat for shrubland species, such as Brewer's sparrow and sage thrasher, and species that occur in

RCAs, such as willow flycatcher. No bald eagle nests are known within 5 miles of the variations, but the variations are within 0.5 mile of golden eagle nests.

Big Game

Big game species present in the B2H Project area for Segment 6 include mule deer, elk, pronghorn, and bighorn sheep. Designated habitat types that are crossed by routes in Segment 6 include winter range for mule deer and bighorn sheep population management units; bighorn sheep core herd home range, bighorn sheep lambing areas, and pronghorn winter range occur within the 5-mile-wide study corridor but are not crossed. Locations of big game habitat crossed by the B2H Project are described by alternative route and route variation below and displayed in MV-10.

Table 3-167 presents the miles of big game habitat types crossed by the centerline of the Applicant's Proposed Action and route variations in Segment 6.

Table 3-167. Big Game Inventory Data for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Bighorn Sheep Population Management Units	Mule Deer Winter Range
Applicant's Proposed Action	28.0	17.5	8.0
Variation S6-A1	*9.3*	*6.7*	*2.3*
Variation S6-A2	*8.9*	*6.8*	*1.9*
Variation S6-B1	*14.4*	*10.8*	*4.2*
Variation S6-B2	*14.1*	*13.2*	*4.8*

Table Notes: Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.

Segment 6 crosses one ODFW WMU, the Owyhee WMU, and one IDFG Game Management Unit (GMU), Unit 40. In the Owyhee WMU, mule deer populations are currently below management objectives and elk populations are currently above management objectives (ODFW 2015b, 2015c). Factors that can affect mule deer and elk populations in the Oregon portion of the B2H Project area are the same as those described for Segment 1. Mule deer in the Unit 40 GMU are part of the Owyhee Population Management Unit. The short- and long-term management objective for the Owyhee Population Management Unit is to increase the population. Management direction for mule deer habitat includes improvement in key winter, summer, and transitional habitats that provide for mule deer populations that meet or exceed statewide objectives (IDFG 2008). Bighorn sheep in the Unit 40 GMU are part of the Owyhee Front Population Management Unit. The management objective is to maintain or increase this population. Habitat degradation and disease are considered the primary threats to the Owyhee Front population (IDFG 2010). Factors affecting populations and management objectives for pronghorn in the B2H Project area were not available.

Applicant's Proposed Action Alternative

The majority of the Applicant's Proposed Action crosses bighorn sheep population management units and mule deer winter range in southern and northern portions of the route (Links 6-10 and 6-25).. Bighorn sheep core herd home range and lambing areas, as well as pronghorn winter range, occur in

the 5-mile-wide study corridor at the southern end of Segment 6 but are not crossed (Links 6-25 and 6-35).

Variations S6-A1 and S6-A2

The majority of Variations S6-A1 and S6-A2 cross bighorn sheep population management units and northern portions cross mule deer winter range (Links 6-5 and 6-10).

Variations S6-B1 and S6-B2

The majority of Variations S6-B1 and S6-B2 cross bighorn sheep population management units and southern portions cross mule deer winter range (Links 6-25 and 6-30). Bighorn sheep core herd home range and lambing areas, as well as pronghorn winter range, occur in the 5-mile-wide study corridor at the southern end of Segment 6 but are not crossed (Links 6-25 and 6-30).

3.2.4.6 Environmental Consequences (Results of Analysis)

Types of Potential Effects

Effects Common to All Wildlife Species

Effects of the B2H Project common to all wildlife species include many direct and indirect effects from construction that would persist through the life of the project (i.e., operations and maintenance). Additional short-term direct and indirect effects may occur during normal operations and routine maintenance of project facilities. The types of potential effects common to all wildlife species include mortality, habitat loss or modification, habitat fragmentation, noise and visual disturbance, increased fire hazard, predation, fugitive dusts, and impacts on water quality. The types of potential effects specific to gray wolf, Washington ground squirrel, Columbia spotted frog, Greater Sage-Grouse, migratory birds (including raptors), and big game are discussed in more detail in separate sections below.

Mortality

Mortality or injury to wildlife species could occur during construction and maintenance of the B2H Project. The probability of mortality or injury of wildlife is likely to be a function of species life history and physiological traits. Small species could be crushed by B2H Project equipment through either the crushing of burrows or of vegetation used as cover. Species with limited mobility such as terrestrial mollusks, including Columbia Oregonian, blue mountainsnail, and shiny tightcoil, would be at a higher risk of mortality from crushing by B2H Project equipment compared to species with greater mobility. Direct mortality to birds could occur if construction activities in bird nesting habitat damages nests or causes mortality to nestlings and fledglings. Additionally, bird and bat mortality could result from electrocution or collisions with the transmission line and other B2H Project features during the operation of the transmission line. Bats are likely to abandon roosts and hibernacula due to human disturbance causing disorientation and potentially resulting in individual mortality. Mortality and injury also could occur as a result of collision with moving construction equipment using access roads associated with the B2H Project.

Habitat Loss or Modification

A direct impact on all wildlife habitat types would be removal of vegetation for the right-of-way, roads, pads for transmission towers, transmission line safety, and ancillary facilities, including regeneration stations, substations, staging areas, and fly yards. Habitat for some species, such as birds, would be affected by obstructing flight paths both vertically and horizontally. Clearing of vegetation for these B2H Project facilities would decrease habitat quantity and quality for wildlife species, and the degree of impact would vary depending on vegetation type and recovery time.

Removal of shrubland wildlife habitats during construction could take more than 20 years to recover and regain their function as wildlife habitat. The effects of this could include changes in plant and wildlife species composition, increase in invasive plants and wildlife, and decrease in reproductive success of sagebrush-obligate wildlife species such as sage thrasher, Brewer's sparrow, and sagebrush lizard. For species that nest in shrubland habitat, such as loggerhead shrike, construction activities during nesting season may prevent birds from using breeding habitat and could cause birds to abandon nest sites. Loss of vegetation cover could result in a loss of nesting habitat for these birds, and also could have an effect on food availability for species that forage in shrublands.

In grassland habitats, construction-related removal of vegetation would cause short-term loss of this habitat type. However, vegetation would regrow following construction, and this habitat type would recover fairly quickly, especially with implementation of proper grazing. Wildlife species that use grasslands would still experience B2H Project-related impacts such as disturbance and increased susceptibility to predation. However, the short-term loss and minimal amount of grassland habitat that would be disturbed during construction would likely have marginal impacts on any wildlife species, as they would move to adjacent undisturbed grassland until disturbed areas are restored to their former state following construction, as long as adjacent habitats have not reached the species'/niche's carrying capacity. Loss of vegetation cover could result in a loss of nesting and foraging habitat for birds, including bobolink, long-billed curlew, common night hawk, and pallid bat.

Forests and woodlands cleared during construction would be affected for much longer than other habitat types. This impact would displace wildlife that use forests and woodlands for many generations until vegetation can recover. In addition, due to the greater potential for edge effects where this habitat type is cleared compared to the other habitat types, forest/woodlands adjacent to cleared areas would be affected as well. Though mature forests are rare in the B2H Project area, the impacts on this forest type, such as edge effects, would be more pronounced due to the more distinct difference between mature forest and adjacent cleared areas, and the longer recovery time of this type of habitat (several decades). Wildlife species that use this habitat type, including northern goshawk, American three-toed woodpecker, great gray owl, gray wolf, Johnson's hairstreak, long-legged myotis, and terrestrial mollusks such as Columbia Oregonian, blue mountainsnail, and shiny tightcoil would experience habitat loss until areas regrow during B2H Project operations, which would take several decades.

Removing trees would cause the loss of both present habitat (canopy cover, live trees, forest understory) and potential future habitat (snags and downed wood from dead, mature trees). Woodland/forest habitat support diverse assemblages of wildlife species, often including species that

are specific to that habitat type. Direct effects on special status birds in woodlands/forest habitat could include a loss of both nesting and foraging habitat due to construction operations. Woodpecker species found within this segment are cavity nesters and forage by gleaning insects from tree trunks and bark. Removal of timber, old growth timber, dying trees, and dead snags would result in a loss of woodlands/forest habitat for these species.

Habitat loss and modification in RCAs is anticipated to be largely avoided through spanning, however, the B2H Project may fragment some patches of riparian woodland as a result of required vegetation management. Riparian areas provide critical breeding and foraging habitat for a variety of avian, mammalian, amphibian, and invertebrate species. Riparian corridors can also provide important migratory routes for a number of species, including big game. Effects on special status birds could include a loss of both nesting and foraging habitat due to construction operations. Removal of dying trees and dead snags in wetland/riparian areas could impact nesting and foraging habitat for amphibians, birds and small mammals. Effects on aquatic mollusks, including shortface lanx, Columbia pebblesnail, and California floater, could include degradation of water quality associated with riparian clearing and sediment associated with access road construction and use.

The construction and use of access roads could modify wildlife habitat by increasing the potential for the introduction and spread of noxious weeds. Species such as the long-billed curlew, which prefers tall grass habitat, could be affected by noxious weed infestations that have the potential to change habitat structure within the grasslands.

Habitat Fragmentation

The B2H Project could affect wildlife by decreasing habitat quality through habitat fragmentation. Habitat fragmentation breaks up contiguous areas of vegetation/habitat into smaller patches. Habitat fragment size plays a crucial role in landscape function and many ecosystem interactions, including the distribution of plants and animals, fire regime, vegetation structure, and wildlife habitat. Unlike other infrastructure that creates a solitary footprint, power lines create a continuous line of fragmentation on both vertical and horizontal levels. B2H Project-related habitat fragmentation also would result in loss of connectivity between breeding, foraging and dispersal habitats for some species.

B2H Project-related habitat fragmentation would result from direct vegetation removal for right-of-ways, roads and ancillary facilities and multi-use areas. For some species, permanent access roads (standard of 8 feet wide, 14 to 16 feet wide during construction) could cause habitat fragmentation by serving as a barrier to movement, thereby isolating subpopulations and increasing the risk of local extirpation (Shepard et al. 2008). This could be predominantly experienced by smaller prey species, less mobile species such as herpetofauna and snails, or those less likely to move through open areas devoid of vegetation such as forest-dependent species. Due to the existing fragmentation of Columbia spotted frog habitat in Segments 5 and 6, creation of roads and disturbance corridors in suitable habitat would increase fragmentation. Impacts resulting from fragmentation would be short term and long term and would begin with the construction of the transmission line and new access roads, upgrading and increase of use on existing roads and would continue for the life of the B2H Project. Habitat reclamation and revegetation following construction should decrease the severity of some impacts.

In addition to breaking up blocks of suitable habitat, fragmentation also increases edge effects, which results when two different types of habitat lie adjacent to one another other. Edge effects can create a number of impacts, from altering nutrient flows/cycling; increasing the rate of invasion by noxious weeds, invasive wildlife species, and pathogens; lowering the carrying capacity of a habitat/patch, and disrupting metapopulation dynamics (Saunders et al. 1991). Although roads may not serve as a barrier to movement for all species, roads also can reduce habitat quality by creating edge effects. Edge effects tend to be more pronounced with increasing differences in adjacent habitat types, for example, mature multi-strata forest adjacent to grassland. The creation of edges in forests impacts microclimatic factors such as wind, humidity, and light, and could lead to a change in plant or animal species composition within the adjacent habitat, or increase the rate of invasion by noxious weeds, invasive wildlife species, and pathogens (Murcia 1995). Terrestrial mollusks, including Columbia Oregonian, blue mountainsnail, and shiny tightcoil, that typically occur in old growth or intact forests and are dependent on a stable microclimate, shadiness, and humidity may be particular sensitive to edge effects associated with forest clearing as suitable habitat adjacent to the right-of-way or other cleared areas would be subjected to increased temperatures and reduced shading and humidity.

The impacts of edge effects on wildlife, both adverse and beneficial, are highly dependent on species' habitat and life history requirements (Baker et al. 2013). For instance, some species are more susceptible to predators or nest predation near edges, while predators and some grazers/browsers (i.e., wolves, mule deer) may benefit from increased food availability. Additionally, prey species may prefer habitat further from edges in clearcut areas where fewer perch sites are available for avian predators (Kremsater and Bunnell 1999). Retained trees in logged areas are preferentially used by some birds for nesting due to a decreased risk of nest predation (Rosenvald and Lõhmus 2008). Not all wildlife species are affected by fragmentation and patch size identically (Bissonette and Storch 2003; D'Eon 2007). Fragmentation caused by the transmission line or access roads could create a barrier to foraging movements and isolate individuals within the habitat. Loss of canopy cover, increased potential for noxious weed infestation, and potential for increased fire regime may cause habitat degradation and abandonment of wildlife habitat.

Noise and Visual Disturbance

Another direct effect on habitat from B2H Project construction would be noise disturbance, which would cause displacement for some wildlife species in the short term. Some construction activities would raise the sound above ambient levels. In particular, noise disturbance would result from implosive devices used to make connections between conductors. The average sound level from detonation of implosive devices is between 118 and 122 A-weighted decibels (dBA) at an approximate distance of 200 feet (BLM 2013). The duration of sound emitted from detonation of an implosive device is short, ranging from approximately 210 to 360 milliseconds (BLM 2013). Since the potential for noise "startle" effects at noise sensitive areas at these distances exists, the use of implosive devices would be limited to daytime periods. Ambient noise in forested habitats generally ranges from 25 to 44 decibels (dB; USFWS 2006), and is usually lower in open and shrub habitats such as those found along the majority of the alternative routes and route variations.

For all wildlife habitat types, increased human presence and noise from construction activities during the nesting season may prevent birds from using breeding habitat and could cause birds to abandon nest sites. B2H Project activities adjacent to occupied roosting habitat for bats may cause behavioral disturbances causing bats to abandon daytime roosts, hibernacula, or maternity colonies. Behavioral disturbance and displacement of special status mammals such as the gray wolf due to construction noise, presence of humans, and construction equipment would occur during construction operations; impacts on gray wolves are discussed further under Federally Proposed, Endangered, Threatened, and Candidate Wildlife Species below.

Visual disturbance also would displace some wildlife species from suitable and/or occupied habitat in and around construction areas. Displacement could result in less available or lower quality forage, loss of access to preferred nesting/breeding sites, increased exposure to predation, and increased energy expenditure. Long-term impacts could result from visual cues that cause wildlife to avoid the area around the transmission line.

Fire Hazard

Construction activities could inadvertently cause fires, causing a loss of habitat and affecting wildlife, potentially both in the short and long term. Because warm and dry conditions are likely throughout the summer, the risk of wildfires during construction of the B2H Project may be elevated. Impacts from fires caused by the B2H Project would include changes in wildlife habitat and direct mortality to some slow-moving and fossorial wildlife species. Increases in fire frequency also could cause permanent changes in vegetation structure and composition resulting in a loss of foraging habitat for many wildlife species.

Increased Predation

The presence of the transmission line and associated structures may provide additional roosting structures for raptors and corvids, thus increasing their presence. Transmission line corridors and access roads may also provide additional connectivity for predators. Species such as Washington ground squirrel and Greater Sage-Grouse would be vulnerable to increased predation.

Fugitive Dust

An indirect effect on habitat that could occur during the construction period is fugitive dust dispersing from the immediate construction area. Impacts from fugitive dust would last longer than the construction timeline. High levels of fugitive dust can impact the growth of some organisms, especially mosses and lichens, and impact water sources. Most impacts from fugitive dust would last only until the next rain event, when the dust is washed away and diluted. Applying dust suppression techniques, such as watering construction areas, would reduce impacts from fugitive dust.

Water Quality

Additional indirect effects on wetland/riparian amphibian and invertebrate species include impacts on water quality due to soil erosion and sedimentation associated with construction of the transmission line and associated facilities, as well as construction and maintenance of access roads. Habitat for sensitive aquatic mollusks, including shortface lanx, Columbia pebblesnail, and California floater, could be subject to these indirect effects.

Federally Proposed, Endangered, Threatened, and Candidate Species

Gray Wolf

Wolves are habitat generalists and historically used or traveled through all habitat types in the B2H Project area. However, gray wolves are now generally more successful in forested habitats with adequate prey base. ODFW has designated Areas of Known Wolf Activity around known pack home ranges and will continue to monitor populations and dispersal activities. No known wolf packs are crossed by the B2H Project. Portions of the B2H Project area are located in the ODFW East Wolf Management Zone where gray wolves retain the status of federally endangered.

Potential direct effects of the B2H Project on gray wolves would be both short and long term and may include habitat displacement, degradation and fragmentation; disturbance; and injury or mortality. If gray wolves disperse through the B2H Project area, human presence, noise, and vehicle use associated with B2H Project construction and maintenance activities could increase the potential for disturbance and vehicle mortality. Potential indirect effects of the B2H Project on gray wolves would be both short and long term and would include increased disturbance and mortality associated with increased human access and activity (e.g., increased illegal hunting of gray wolves), and periodic disturbance and noise associated with vehicle use and human presence during maintenance activities subsequent to construction.

Other Special Status Species

Columbia Spotted Frog

Direct effects on Columbia spotted frog (Great Basin distinct population segment) would be both short and long term and would include habitat removal, modification, and fragmentation/loss of connectivity; direct mortality from ground disturbance and heavy equipment operations, as well as vehicle use associated with construction and maintenance activities; displacement; increased downstream sedimentation and erosion at breeding sites; removal of habitat (changes in water turbidity and temperature); and noise-related disturbance during the breeding season.

Indirect effect of construction and maintenance would be both short and long term and would include increased disturbance and mortality from increased human access and activity, an increase in predation by raptors and ravens that perch and nest on the new transmission line structures, alteration of native vegetation, and potential introduction and spread of weeds. The change in vegetation community structure could reduce the effectiveness of habitat in providing cover from predators (e.g., herons, bullfrogs, and garter snakes). Invasive plants and noxious weeds could be introduced or spread by vehicles and equipment used during construction or by subsequent public use of access roads constructed for the B2H Project, degrading Columbia spotted frog habitat. The potential spread of invasive plants and noxious weeds would be minimized through the development and implementation of a Noxious Weed Management Plan.

Fugitive dust resulting from construction activities and use of B2H Project access roads could result in indirect effects on Columbia spotted frog in the form of increased water turbidity. Dust production is expected only during construction activities and use of access roads that have not yet revegetated;

operation and regular maintenance of the transmission line are expected to produce a relatively small amount of dust or turbidity in waterbodies. Effects from fugitive dust are discussed further above.

Greater Sage-Grouse – Direct Effects

Potential direct effects on Greater Sage-Grouse from construction, operation, and maintenance of the B2H Project would be both short and long term and would include mortality due to electrocution; in-flight collisions with transmission line infrastructure; collisions with construction and maintenance vehicles; fragmentation of habitats due to the introduction of tall structures, increased EMFs, and construction of new roads; loss and degradation of habitat quality and function; disturbance to breeding activities due to increased human presence and noise at lek locations; disturbance during sensitive periods resulting from human presence, vehicle use, and noise during construction and maintenance; and interruption and/or alteration of seasonal migrations and movements among populations.

Mortality Due to Electrocution from Contact with Power Line Infrastructure

Electrocution of birds and other wildlife by power lines have been observed due to animals' simultaneous contact with grounded and energized electrical equipment. Electrocution of birds can occur when the distance between phase conductors or the distance between grounded and energized hardware is less than the wrist-to-wrist or head-to-foot distance of a bird (APLIC 2006). There would be no potential for electrocution of Greater Sage-Grouse due to contact with energized electrical infrastructure because the distance between conductors, or an energized conductor and a grounded element of the transmission line infrastructure, would be much greater than the wingspan or head-to-foot measurement of a Greater Sage-Grouse.

Mortality Due to Collisions with Power Line Infrastructure

Transmission lines proposed in Greater Sage-Grouse habitat in the B2H Project area may pose a risk for mortality and injury from in-flight collision. Factors influencing avian transmission line collisions include the location and configuration of transmission lines, species-specific tendencies for collision, and environmental conditions, including weather, topography, and habitat (APLIC 2006). Greater Sage-Grouse are unlikely to collide with the proposed transmission line due to their tendency for short, low flights and the elevation of the proposed conductors. However, in-flight collisions with transmission line towers is possible; the probability of collision with transmission line towers is greater for Greater Sage-Grouse than for some other bird species due to their larger size and low flight maneuverability (APLIC 2012).

Mortality Due to Collisions with Vehicles Traveling on Roads

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for Greater Sage-Grouse mortality as a result of collisions with construction and maintenance vehicles. Wildlife mortalities due to collisions with moving vehicles occur most frequently on well-traveled secondary roads and highways. The potential for wildlife collisions with vehicles on tertiary, unimproved, and one-lane roads is lower than on larger improved surface roads as the frequency of travel is relatively low and vehicle speeds are limited by road conditions. To the extent possible, existing roads in their present condition without improvement would be used to access the right-of-way. Existing roads in Greater

Sage-Grouse habitat likely to be used to access the B2H Project during construction and maintenance would generally be unimproved roads and only suitable for low-speed vehicle travel (25 mph or slower). Access roads constructed for the B2H Project would not be improved to a degree that vehicles traveling on these roads could reach high speeds. The B2H Project would require construction of new access roads and increased traffic on existing access roads during construction and maintenance activities. Due to the limitation of construction and maintenance vehicle speeds because of access road conditions, the probability of Greater Sage-Grouse mortality from collisions with vehicles traveling on access roads would be low. Additionally, a Traffic and Transportation Management Plan would be developed and incorporated into the POD to help reduce all potential environmental impacts related to transportation.

Loss and Degradation of Habitat Quality and Function

Construction of the B2H Project in Greater Sage-Grouse habitat would result in loss and degradation of Greater Sage-Grouse habitat quality and function. Removal of vegetation in Greater Sage-Grouse nesting, brood-rearing, and wintering habitat as a result of construction of transmission line towers and access roads would result in habitat loss and degradation. Direct loss of Greater Sage-Grouse habitats as a result of B2H Project construction would be minimized through restoration of areas not required for ongoing operation and maintenance of the transmission line in accordance with the Reclamation, Revegetation, and Monitoring Plan Framework to be included as a part of the POD.

Fragmentation of Habitats due to the Introduction of Tall Structures, Increased Electromagnetic Fields, and Construction of New Roads

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for fragmentation of habitats primarily as a result of avoidance of habitats near the transmission line due to the introduction of tall structures, EMF, and new roads.

Greater Sage-Grouse experts and agency personnel have raised concerns that Greater Sage-Grouse may avoid areas that contain tall structures (Braun 1998; Braun et al. 2002; Dinkins et al. 2014; Gillan et al. 2013; Pruett et al. 2009; Shirk et al. 2015; USFWS and BLM 2015) and areas adjacent to transmission lines due to the presence of EMFs near the line (USFWS 2010b). Based on recent research (Gillan et al. 2013; Hanser et al. 2011b; Shirk et al. 2015; Washington Wildlife Habitat Connectivity Working Group 2012), the USFWS and BLM (2015) reported that Greater Sage-Grouse may avoid habitat up to 600 meters (0.37 mile) from transmission lines. A USGS review of factors influencing Greater Sage-Grouse conservation concluded that Greater Sage-Grouse may avoid habitats within 0.4 to 2.9 miles of transmission lines, that erection of a transmission line close to a lek may negatively influence lek attendance and breeding season behavior, and that higher densities of power lines within 4.0 miles of a lek may negatively influence lek persistence (Manier et al. 2014). These distances are an attempt to balance the extent of protected areas with multiple land-use requirements using estimates of the distribution of Greater Sage-Grouse habitat. The authors stated that there is no single distance that is an appropriate buffer for all Greater Sage-Grouse populations and habitats because of variations in populations, habitats, development patterns, and other factors. They also acknowledge that

scientifically justifiable departures may be warranted based on local data and other factors when implementing buffer protections or density limits (Manier et al. 2014).

Across the western range of the species, habitat suitability as measured by the presence of active leks was highest in areas with power line densities less than 0.037 mile (of overhead transmission line) per square mile and leks were absent from areas where power line densities exceeded 0.124 mile (of overhead transmission line) per square mile (Knick et al. 2013). Displacement of Greater Sage-Grouse from occupied habitats may occur as a result of construction of transmission line towers, the tendency of Greater Sage-Grouse to avoid tall structures, and in response to increased raptor presence as a result of the presence of transmission towers on which raptors perch. Braun (1998), citing unpublished data, reported that Greater Sage-Grouse use of areas, near transmission lines, as inferred from pellet counts, increased as distance from transmission lines increased up to 1,969 feet. Similarly, in a comparison of Greater Sage-Grouse radiotelemetry locations in Idaho to locations of anthropogenic features, Gillian et al. (2013) found that Greater Sage-Grouse avoided areas within 1,969 feet of power transmission lines and 492 feet of buildings, and Hanser et al. (2011b) found a negative association between modeled Greater Sage-Grouse occurrence within 1,640 feet of energy development, power lines, and major roads in Wyoming using pellet count data. In Washington, Greater Sage-Grouse movement, gene flow, and lek activity are affected by transmission lines at distances greater than 1,640 feet (Washington Wildlife Habitat Connectivity Working Group 2012; Shirk et al. 2015).

Ellis (1985) found that construction of a transmission line altered dispersal patterns of breeding Greater Sage-Grouse, suggesting a transmission line could be a potential barrier to movements and, thus, result in habitat fragmentation. The transmission line was constructed within 656 feet of an active Greater Sage-Grouse lek and was situated between the lek and male breeding season day-use areas and resulted in a 72 percent decline in the mean number of displaying males and an alteration in daily dispersal patterns during the breeding season within two years of construction (Ellis 1985). The frequency of raptor-Greater Sage-Grouse interactions during the breeding season increased 65 percent between before and after transmission line comparisons (Ellis 1985). In other studies, the probability of lek persistence decreased with proximity to power lines and the increasing proportion of power lines in a 4-mile area around leks (Walker et al. 2007), and Greater Sage-Grouse avoided brood-rearing habitats within 2.9 miles of transmission lines (LeBeau 2012).

Greater Sage-Grouse populations rely on large, interconnected expanses of sagebrush and the majority of Greater Sage-Grouse populations throughout the western range of the species are connected by landscapes characterized by moderate-to-high potential for Greater Sage-Grouse movement (Knick et al. 2013; Wisdom et al. 2011). Lek persistence has been shown to be strongly related to lek connectivity, a measure of a lek's influence on the maintenance of range-wide population connectivity evaluated at a dispersal distance of 18 kilometers with abandoned leks having lower range-wide connectivity importance (Knick and Hanser 2011). As described previously, transmission lines could be a potential barrier to Greater Sage-Grouse movements (Ellis 1985; Shirk et al. 2015) and could limit dispersal between leks and populations, which could compromise lek and population persistence.

Increased EMFs have been shown to alter the behavior of avian species, though species vary in their sensitivity to this disturbance (Fernie and Reynolds 2005). Peer-reviewed studies regarding Greater Sage-Grouse reactions to EMFs have yet to be published. The potential effects of EMFs from the B2H Project are described in Section 3.2.18. If Greater Sage-Grouse avoid EMFs created by transmission lines, the effects are likely to be similar to those described for introduction of tall structures.

Traffic on B2H Project access roads will be greatest during construction of the transmission line, and in general, road effect-distances (the distance from a road at which a population density decrease is detected) are positively correlated with increased traffic density and speed (Forman and Alexander 1998). After completion of construction of the transmission line, B2H Project- and non- B2H Project-related traffic on access roads developed for the B2H Project would likely be low and avoidance of Greater Sage-Grouse habitats due to vehicle presence associated with access roads is expected to be minimal.

Disturbance and Disruption of Breeding Activities due to Increased Human Presence and Noise at Lek Locations

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for disturbance to Greater Sage-Grouse and disruption of breeding activities due to increased human presence and other construction equipment at lek locations. Several studies have demonstrated that roads near Greater Sage-Grouse leks may influence female habitat selection (Lyon and Anderson 2003) and that levels of road-related effects are positively correlated with increased traffic (Holloran 2005; Remington and Braun 1991). Greater Sage-Grouse have been shown to avoid nesting and summering near paved secondary highways (LeBeau 2012). Lyon and Anderson (2003) reported that traffic disturbance (1 to 12 vehicles per day) within 1.9 miles of leks during the breeding season reduced nest-initiation rates and increased distances moved from leks during nest site selection of female Greater Sage-Grouse. Rates of decline in male Greater Sage-Grouse lek attendance increased as traffic volumes on roads within approximately 1.9 miles of leks increased and vehicle activity on these roads during the daily strutting period (i.e., early morning) had a greater influence on male lek attendance compared to roads with no vehicle activity during early morning hours in another study (Holloran 2005). Peak male attendance (i.e., abundance) at leks experimentally treated with noise recorded at roads in a gas field, decreased 73 percent relative to paired controls. Blickley et al. (2012) suggest that the intermittent noise like that produced by traffic was a cause of declines in male lek attendance on leks near roads. Impacts of anthropogenic activity have been documented at leks at a distance of up to 3.7 miles (Naugle et al. 2011). Implementation of seasonal and spatial restrictions around leks would be expected to minimize disturbance associated with noise and human presence.

Minimal traffic disturbance (1 to 12 vehicles/day) within 1.86 miles of leks during the breeding season reduced nest-initiation rates and increased distances moved from leks during nest site selection of female Greater Sage-Grouse; nesting propensity was 26 percent lower for females breeding on road-disturbed leks compared to undisturbed females, and females moved twice as far from leks to nest locations if breeding on disturbed leks (Lyon and Anderson 2003). Additionally, Greater Sage-Grouse male lek attendance decreased proportionally with traffic volumes on roads near leks (Holloran 2005).

Therefore, even slight long-term increases in B2H Project and non- B2H Project-related traffic as a result of newly constructed roads has the potential to adversely influence Greater Sage-Grouse distribution and reproduction throughout the life of the B2H Project.

Disturbance to Wintering Periods Resulting from Human Presence, Vehicle Use, and Noise During Construction and Maintenance

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for disturbance to Greater Sage-Grouse during wintering periods resulting from human presence, vehicle use, and noise during construction and maintenance of the B2H Project.

Greater Sage-Grouse were found to be 30 percent more likely to occupy sagebrush-dominated habitats with no gas field infrastructure compared to habitats with 12.3 wells per 2.5 square miles (i.e., maximum allowable well density on federal lands) during the winter (Doherty et al. 2008). In central Wyoming, Greater Sage-Grouse at the scale of a home range avoided natural gas wells; at the scale of the population, avoidance of haul roads associated with natural gas development were observed during the winter (Dzialak et al. 2012). At a study site in southern Alberta, Canada, the probability of Greater Sage-Grouse selection of winter habitat declined when these habitats were within 1,900 meters of oil or natural gas wells (Carpenter et al. 2010). Other research suggests that disturbance to wintering Greater Sage-Grouse from energy development are related to human activity levels; variation in avoidance response to natural gas wells among Greater Sage-Grouse individuals between day and night locations (e.g., avoidance of infrastructure during the day, but not at night) suggests avoidance of human activity (Dzialak et al. 2012). Braun (2006) suggests dissuading raptor perching on transmission line poles situated in suitable winter habitat (along windswept ridges and near large expanses of sagebrush that are not typically covered by snow in winter) to minimize the influence of avian predators perching on transmission lines on wintering Greater Sage-Grouse populations.

Interruption and/or Alteration of Seasonal Migrations and Movements Among Populations

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for interruption and/or alternation of seasonal Greater Sage-Grouse migrations and movements among populations. As previously described, construction of transmission line structures and new access roads could result in Greater Sage-Grouse avoiding areas near the transmission line such that those habitats are no longer used by Greater Sage-Grouse, and could present a barrier to Greater Sage-Grouse movements. If Greater Sage-Grouse responses include avoidance of areas near the transmission line and/or reduction of movements across the transmission line right-of-way, the B2H Project may fragment and reduce the connectivity of Greater Sage-Grouse habitats in the B2H Project area. These effects could result in alteration of seasonal Greater Sage-Grouse migrations or movements among populations if habitats affected represent important seasonal habitat or habitat important for providing connectivity between populations. Gene flow in Greater Sage-Grouse populations is likely limited to the movement of individuals between neighboring leks and populations and not likely the result of long-distance movements of individuals across large portions of the species' range (Oyler-McCance et al. 2005). Thus, regional connectivity between leks and populations may represent a fundamental source of genetic recombination and metapopulation structure that supports

the long-term viability of the species. Additionally, connectivity between leks has been shown to be important for population sustainablity (Knick and Hanser 2011; Knick et al. 2013). Studies have shown that Greater Sage-Grouse that attend leks up to 11 miles from disturbances could be affected by the loss of seasonal habitat functionality (Nelle et al. 2000).

Greater Sage-Grouse Indirect Effects

Potential indirect effects on Greater Sage-Grouse from construction, operation, and maintenance of the B2H Project would be both short and long term and would include alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds, as well as an increase in anthropogenic fire start; avoidance of habitat due to potential increase in raptor predation pressure; disruption of nesting and breeding activities and avoidance of habitat due to vehicle noise and human presence resulting from public use of new access roads; increased mammalian predation risk; increased raptor and raven predation risk; alteration of behavioral patterns due to increased predation pressure; and increased disturbance and mortality associated with increased human access and activity (e.g., increased illegal hunting).

Avoidance of Habitat Due to Potential Increase in Raptor Predation Pressure

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for predation of Greater Sage-Grouse by raptors and ravens in areas around the transmission line. Greater Sage-Grouse may respond to increased predation pressure around the transmission line (Connelly et al. 2004) by avoiding areas where predators are concentrated and predation pressure is highest (Dinkins et al. 2012).

Reductions in male use of strutting grounds have been attributed to increased predation by golden eagles and ravens up to 3.7 miles from overhead power transmission and communication distribution lines (California Partners in Flight 2005; Manville 2004). If raptors and ravens are concentrated around the transmission line, Greater Sage-Grouse may abandon or reduce their use of habitats near the transmission line, effectively reducing the amount of habitat available to individuals and populations and potentially displacing birds into suboptimal habitats (Connelly et al. 2004).

Disruption of Nesting and Breeding Activities and Avoidance of Habitat Due to Vehicle Noise and Human Presence Resulting from Public Use of New Access Roads

New access roads could increase public use of lands in Greater Sage-Grouse habitat. The new access roads constructed for the B2H Project would facilitate public use of Greater Sage-Grouse habitats that are rarely visited by humans in their current condition due to their distance from developed roads. Increased vehicle noise and human presence due to public use of access roads would be expected to occur at low levels as the B2H Project predominately crosses Greater Sage-Grouse habitat in rural areas where existing public use of access roads and public lands are generally low. Construction of the B2H Project is not anticipated to create an attraction that would increase public visitation to the area following construction. Effects on Greater Sage-Grouse and Greater Sage-Grouse habitat use associated with vehicle noise and increased human presence resulting from public use of new access roads would be similar to the direct effects of construction on Greater Sage-Grouse habitat use and nesting and breeding activities. However, the intensity of the effects on Greater Sage-Grouse due to

public use of access roads would be expected to be less than the effects described for construction due to the anticipated infrequent public use of access roads. Furthermore, impacts from increased public use would be minimized through closure or rehabilitation of new access roads in sensitive habitat following construction.

Increased Predation Risk by Mammalian Predators

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for predation risk to Greater Sage-Grouse due to an increase in mobility of mammalian predators along the transmission line corridor and increased detectability of Greater Sage-Grouse to mammalian predators due to removal of escape cover. Improvement of old or construction of new access roads between tower locations would occur during B2H Project construction. Roads can provide corridors for mammalian predator movement, which may result in increased Greater Sage-Grouse predation (Kuipers 2004). Greater Sage-Grouse may experience increased predation by mammalian predators due to the lack of escape cover and increased visibility of Greater Sage-Grouse to mammalian predators when using these corridors.

Increased Predation Risk by Raptors and Ravens

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for predation of Greater Sage-Grouse by raptors and ravens. Ravens preferentially use habitats and nest in proximity to transmission lines (Coates et al. 2014a; Howe et al. 2014). Raptors and ravens are known to prey on nesting and foraging Greater Sage-Grouse in addition to individuals on leks (Hagen 2011; Lockyer et al. 2013). Tall structures (including transmission line towers) provide nesting sites and hunting perches for raptors and ravens in areas where vegetation is low and terrain is relatively flat (Connelly et al. 2000; Ellis 1984; Johnson et al. 2011; Steenhof et al. 1993). Transmission line poles and towers have been shown to influence raptor and corvid distributions and hunting efficiency (Coates et al. 2014a 2014b; Connelly et al. 2004; Steenhof et al. 1993), which may result in increased predation on Greater Sage-Grouse. Knick and Connelly (2011) reported foraging distances of avian Greater Sage-Grouse predators at 4.3 miles, suggesting that the extent of habitat indirectly affected as a result of existing and planned transmission line infrastructure could be substantial (Connelly et al. 2004; Cresswell et al. 2010). Leks in proximity to transmission lines have been found to have lower annual recruitment of individual birds when compared to leks farther from these lines. The difference was presumed to be a result of raptor predation (Braun et al. 2002). Implementation of nest management practices outlined in the Applicant's Avian Protection Plan (Idaho Power Company 2015), as well as perch deterrents (Selective Mitigation Measure 15), would reduce nesting and perching on B2H Project structures and minimize an increase in avian predation.

Alteration of Behavioral Patterns Due to Increased Predation Pressure

Construction of the B2H Project in Greater Sage-Grouse habitat could increase predation pressure on Greater Sage-Grouse from avian and mammalian predators. Greater Sage-Grouse may respond to increased predation pressure by increasing sheltering behavior to avoid predation and reducing or shifting temporally other essential behaviors (e.g., foraging) (ODFW 2011). These behavioral shifts may

reduce the fitness of individual Greater Sage-Grouse that occupy habitats near the transmission line, which may ultimately influence survival (Holloran 2005).

Alteration of the Native Sagebrush Understory through Introduction and Spread of Non-native, Invasive Plants and Noxious Weeds

Construction of the B2H Project in Greater Sage-Grouse habitat could increase the potential for introduction and spread of non-native plants and noxious weeds, most notably cheatgrass in Greater Sage-Grouse habitats. Invasive plants and noxious weeds could be introduced or spread by vehicles and equipment used during construction or by subsequent public use of access roads constructed for the B2H Project. Cheatgrass has been a major factor in the loss of big sagebrush communities (Chambers et al. 2007) and is consistently cited as a major challenge to the maintenance of sagebrush-steppe habitats (Knick 1999; Young and Allen 1997). Invasive plants such as cheatgrass and medusahead displace desirable native plant species and degrade rangeland health. In many cases the displaced species are critical to Greater Sage-Grouse survival (NRCS 2010). Degradation of Greater Sage-Grouse habitat due to invasion of non-native plants and noxious weeds could lead to decreased survival of individual birds in affected populations and a reduction in the carrying capacity of sagebrush habitats.

In addition to cheatgrass' displacement of native understory species, infestation leads to an increased risk of wildfires that eliminate the sagebrush overstory because cheatgrass germinates early and, thus, dries early in the growing season (Klemmedson and Smith 1964). Sagebrush plant communities important for Greater Sage-Grouse survival could be destroyed by fire and habitats require decades to recover. Moreover, fires promote the proliferation of invasive annual grasses and could result in the permanent conversion of sagebrush-dominated habitats to habitats of annual grasslands. Prior to re-establishment of sagebrush cover, these sites often have limited or no value to Greater Sage-Grouse (Connelly et al. 2000). More frequent fires in Greater Sage-Grouse habitats as a result of construction of the transmission line, access roads, and alteration of vegetation communities could result in reduced local Greater Sage-Grouse population size and reduction of suitable habitat available for Greater Sage-Grouse in the B2H Project area.

Washington Ground Squirrel

Potential direct effects of the B2H Project on the Washington ground squirrel would be both short and long term and would include direct mortality, disturbance, habitat fragmentation, and loss or modification of habitat. Ground disturbance and heavy equipment operation during construction could result in Washington ground squirrel injury or mortality, destruction of burrows, and/or degradation of foraging and dispersal habitat. Vehicle use associated with B2H Project construction and maintenance activities also could increase the potential for disturbance and vehicle mortality. Habitat loss, degradation, and fragmentation could increase habitat patch isolation, reduce potential connectivity between patches and subpopulations, and impact dispersal rates and abundance for Washington ground squirrel (Hanser et al. 2011a; Noss et al. 2006). Construction-related noise, human presence, and dust disturbance also could impact Washington ground squirrel during construction and could

potentially make habitat temporarily unsuitable for this species. Exposure to EMFs does not appear to adversely affect small mammals, such as the Washington ground squirrel.

Indirect effects from the B2H Project would be both short and long term and could include conversion of native grassland to less desirable habitat types, habitat loss or modification due to altered fire regimes, facilitation of invasive plant establishment, and increased disturbance from an increase in recreational access from B2H Project access roads. There also could be an increase in predation by raptors that perch and nest on the new transmission towers; however, the potential for raptor perching and nesting on transmission line structures already exists in some areas, but the proposed transmission towers would be taller than the existing towers and could result in more raptor predation than there is at present. Because juvenile Washington ground squirrels regularly disperse from occupied colonies (Klein et al. [2005] found an average dispersal probability of 0.72), this increased predation could impact squirrels attempting to disperse into suitable but unoccupied habitats in addition to squirrels present in occupied habitats (i.e., colonies).

Migratory Birds Including Raptors

Potential impacts from the B2H Project on migratory birds, including bald and golden eagles, BLM Species of Conservation Concern, and USFWS BCC, would be both short and long term and could include collisions with construction vehicles, power lines, other equipment, or structures; direct removal of nesting habitat; destruction of unoccupied nests; induced abandonment of nests or breeding territories due to disturbance; electrocution; and fugitive dust; noise and visual disturbance. There is unlikely to be measurable impacts on any non-sensitive migratory bird populations, but there would be some impact on individuals and habitat.

Noise during construction could impact migratory birds by masking auditory communication, such as individuals defending territory or trying to attract a mate, flock members making contact calls, nestlings begging for food, or alarm calls (Parris and Schneider 2008). These impacts could have an effect on reproductive success or survival. Nesting birds are particularly sensitive to disturbance, and some disturbance could lead to nest failure or abandonment.

Bird electrocutions on power lines have been documented and are a function of size, habitat, behavior, age, season, and weather (Avian Power Line Interaction Committee [APLIC] 2006). Large body size is considered a primary factor in determining electrocution risk, as is the use of transmission line structures for perching or nesting. Raptors and large wading birds are therefore at higher potential risk than smaller birds (APLIC 2006). Raptor nests on transmission line towers also can increase the risk of interruptions and outages, and can potentially catch fire in wet conditions when located over exposed, energized equipment (APLIC 2006).

The risk of mortality and injury to birds from in-flight collisions with B2H Project components such as conductors and structures is likely to vary with species (Faanes 1987; Loss et al. 2015). The risk of collision with transmission lines has been linked to bird morphology (body size, weight, and wing shape), age, and behavior (flocking, nesting, courtship, foraging, flight ability, and altitude) (APLIC 2006, 2012; Janss 2000). The risk of collision also increases according to the number of times birds

cross transmission lines, or in species with low flight maneuverability, and in locations where power lines cross bird landing or take-off paths (Janss 2000). Collision risk is typically highest where concentrated bird activity occurs (APLIC 2012). The configuration of conductors and ground wires also affects the level of risk, which appears to increase with the number of tiers of wires that require birds to make vertical adjustments (APLIC 2012). Research shows avian collisions with transmission lines can be significantly reduced, but not eliminated, by applying flight diverters at locations where collision risk is elevated (Savereno et al. 1996). Additionally, introduction of new collision risk from proposed transmission lines could be reduced through colocation with existing transmission lines.

Removal of trees would affect both present and future habitat for cavity-nesting birds, such as woodpeckers and bluebirds. Snags are a vital habitat element for many species, and removal of snags, plus the removal of mature trees that would become snags, would decrease nesting substrate and foraging habitat for these species.

Direct impacts on raptors would be both short and long term and could include collision with B2H Project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. Raptors are particularly sensitive to disturbance during the nesting period and some construction activities could cause nest failure or abandonment.

Potential indirect effects on raptors would be both short and long term and could include increased non-B2H Project-related, human activity along the right-of-way and B2H Project roads, which could add to the intensity of disturbance within the study corridor. Disturbance from this could render some areas temporarily unsuitable as raptor habitat. This could be especially critical during the nesting season; at that time, disturbance could be sufficient to scare a raptor from its nest or disrupt brooding or feeding. Increased disturbance and mortality could result from increased human access and activity (e.g., increased illegal shooting of raptors). Increased human presence also could increase the risk of fire, which would alter raptor habitat and prey populations, and possibly cause nestling mortality. The impacts on habitat and small mammals described above, including habitat loss and edge effects, brought about by vegetation alterations and removal could lead to a change in plant species composition, potentially lowering the quality of habitat for raptors and/or their prey and the population size and robustness. Decreased prey for raptors would likely have negative implications for the condition and trend of raptor populations.

Transmission line towers also may increase raptor nest site availability and alter raptor distribution on the landscape. Steenhof et al. (1993) found that 133 pairs of raptors and ravens (*Corvus corax*) nested along a 500-kV transmission line in Idaho in 11 years of initial construction, and 82 percent of pairs nested on the power line during successive years. Ferruginous hawks (*Buteo regalis*), red-tailed hawks (*B. jamaicensis*) and great horned owls (*Bubo virginianus*) are known to nest on transmission towers (Gilmer and Wiehe 1977). Ferruginous hawks were the most common raptor nesting in the towers; great horned owls were observed using abandoned ferruginous nests in the following breeding season (Gilmer and Wiehe 1977).

It is difficult to determine whether nesting raptors benefit from an increase in nest site availability as a result of transmission tower construction. For example, continuous, long-term EMF exposure can affect reproductive success of species such as the American kestrel (*Falco sparverius*), increasing fertility, egg size, embryonic development, and fledging success, but reducing hatching success (Fernie et al. 2000; Fernie and Reynolds 2005). However, Dell'omo et al. (2009) found no significant short-term physiological effects on kestrel hatchlings. Furthermore, species such as ferruginous hawks can increase nesting and fledgling success in artificial nest sites compared to natural sites (Tigner et al. 1996).

Types of potential effects on migratory birds would be similar for all alternatives and route variations. However, in areas of concentrated bird activity such as the Boardman Grasslands Important Bird Areas or the Ladd Marsh Important Bird Areas, migratory bird collision risk would be higher. The introduction of new collision risk would be reduced through colocation or replacement of existing transmission lines.

Big Game

Direct impacts on big game from construction would be both short and long term and could include vehicle collisions, noise, habitat loss, and visual disturbance, which is a change in the viewshed of the animal that is perceived as alarming. Vegetation clearing has the potential to alter big game designated winter range. Alterations to winter range could remove forage that is already scarce during that time of year. However, for the B2H Project, vegetation clearing in general is not expected to negatively impact big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species, and because the cleared areas would still provide forage as they recover. Exponent (2015) found that exposure to EMFs does not adversely affect elk or mule deer; however, this research has not been peer-reviewed.

Noise and visual disturbance associated with increased human activity could displace big game from preferred areas. These disturbances could potentially alter migratory and breeding activities during construction. Displacement of big game from winter areas during sensitive periods also could occur. This displacement could affect over-winter survival on winter range by causing animals to mobilize stored bodily energy reserves that are needed to survive the winter when food is scarce.

Potential indirect effects on big game from the B2H Project would be both short and long term and would include fugitive dust, increased predation and hunting, habitat alteration, and increased human activity. Travel patterns of wide-ranging carnivores can be positively influenced by roads and trails (Paquet and Carbyn 2003). Therefore, rates of predation could increase as a result of behavioral response to B2H Project features. Access roads may facilitate increased hunting and poaching pressures on big game (Gaines et al. 2003). Increases in non-B2H Project-related human presence in the B2H Project area could lead to increased harvest of big game and an increased risk of fire, which would alter habitat for big game. Additionally, invasive plant species could be introduced and spread as a result of increased human presence; the spread of invasive plants could alter available cover and food quantity and quality for big game species.

Increased human activity along the right-of-way and access roads could cause increased disturbance to big game. Activity of big game species in the right-of-way can be low compared to adjacent habitat, while the tendency for animals to cross a right-of-way can be a function of species response to disturbance (Sopuk and Vernam 1986) as well as right-of-way characteristics such as width (Willyard et al. 2004). Large ungulates can be attracted to right-of-ways by increased forage potential (Willyard et al. 2004), potentially due to vegetation reclamation efforts.

Response to disturbed right-of-way sites differs between big game species. Elk, in particular, are known to avoid habitat near roads due to human activity and increased traffic (Ager et al. 2003; Johnson et al. 2000; Millspaugh 1999; Wisdom 1998). The indirect effects from increased traffic in elk winter and summer range can affect the overall success of elk populations by reducing habitat use, fragmenting the landscape and reducing migration corridors, and impeding the ability of elk to carry out important life processes (ODFW 2015a). ODFW (2015a) identifies short-term and long-term displacement from otherwise suitable habitat which provides essential or important habitat functions and values as a primary mechanism of indirect impacts from energy facility roads on elk. Avoidance of habitat near roads or other areas where activity is occurring could temporarily render habitat unsuitable and could increase energetic demands on animals as they move away from the disturbance. This could be especially problematic if it occurs on designated winter range areas during critical times of year. Conducting construction activities outside the recommended winter restriction periods and restricting traffic on access roads during the operations phase of the B2H Project would reduce indirect impacts on elk habitat. However, the ability to successfully restrict traffic access to facility roads may vary depending on land ownership, landscape position, and surrounding land use.

Initial and Residual Impact Assessment Results

A summary of the levels of initial and residual impacts on wildlife resources associated with the B2H Project are presented in Table 3-140 (Section 3.2.4.4). As explained under Impact Assessment and Mitigation Planning in Section 3.2.4.4, initial impacts are those effects resulting from the implementation of the B2H Project, with consideration of the design features of the B2H Project for environmental protection, and residual impacts include those impacts on wildlife resources that are anticipated after the application of selective mitigation measures. The impact assessment results are described by segment and alternative route below.

No Action Alternative

Under this alternative for all B2H Project segments, the environment would remain as it presently exists.

Environmental Consequences Common to All Segments

Traditional Foods

In all segments, the B2H Project would affect wildlife resources that are considered traditional foods by Native American tribes. These resources include big game and waterfowl and are analyzed by segment below (waterfowl are analyzed under Migratory Birds Including Raptors as species occurring in RCAs).

Project impacts on wildlife have the potential to affect tribal exercise of tribal treaty rights. Potential direct effects on wildlife resources of tribal concern include altered availability and changes in habitats of these resources. Potential indirect effects include impacts on ability to gather traditional foods (e.g., decreased access to traditional use areas established by treaties), effects on indigenous peoples relationships with traditional foods, effects on tribal culture and livelihood and health (physical, mental, spiritual), and impacts on retaining traditional knowledge.

Geotechnical Investigation

Disturbance to soil and vegetation in wildlife habitat could occur as a result of overland vehicle access or foot traffic during geotechnical surveys and preconstruction special status species surveys. Overland vehicle access for geotechnical surveys will be restricted to routes designated in the POD, and special status species surveys would follow agency-approved protocol and would minimize ground disturbance to the extent possible. However, even minimal disturbance in habitat that is rare, highly erodible, or otherwise particularly sensitive could have detrimental effects on a species.

Resource-avoidance measures for the geotechnical investigation would include (1) monitor geotechnical investigation activities, (2) adjust activities to occur outside of seasonal restrictions, (3) use alternative access or drilling methods, (4) relocate the borehole, and (5) abandon the geotechnical site. Selective mitigation measures also could be applied to reduce potential effects on wildlife resources.

SEGMENT 1—MORROW-UMATILLA

Wildlife Habitat

Alternative Routes and Route Variations

Wildlife habitat types that would be affected by the B2H Project in Segment 1 include grasslands, shrublands, RCAs, and forest/woodlands. Additionally, the Applicant's Proposed Action Alternative, the Applicant's Proposed Action – Southern Route Alternative, the East of Bombing Range Road Alternative, and the West of Bombing Range Road – Southern Route Alternative could affect shrublands and RCAs on the Coyote Springs Wildlife Area. The amount of wildlife habitat types that would be disturbed by each alternative route and route variation in Segment 1 is provided in Table 3-120, and residual impacts on each wildlife habitat type is provided in Table 3-119 in Section 3.2.3. The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6. The primary impact on wildlife habitats would include habitat removal and fragmentation. The Applicant's Proposed Action and all alternatives and variations in Segment 1 would result in moderate residual impacts on shrubland and forest/woodland habitat types because they support a wide range of species and are slow to regenerate. Loss or adverse modification of native grassland habitats would result in moderate residual impacts because they are uncommon throughout the B2H Project area and, therefore, habitat for grassland species is limited. Although disturbance to RCAs is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible (Design Features 15 and 16), the B2H Project in Segment 1 would have moderate residual impacts on this valuable wildlife habitat type.

Federally Proposed, Endangered, Threatened, and Candidate Species

Gray Wolf

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have short- and long-term residual impacts on gray wolf. Potential mortality of federally endangered gray wolves would result in short-term high residual impacts. Disturbance or displacement from habitat would result in moderate long-term residual impacts but would not severely limit the long-term sustainability of populations of federally endangered gray wolves impacts from the Applicant's Proposed Action Alternative. The types of potential effects on gray wolf are described in detail at the beginning of Section 3.2.4.6.

Impacts on gray wolves and their habitat would be decreased through implementation of design features of the B2H Project for environmental protection and selective mitigation measures, including a speed limit on B2H Project access roads to reduce collisions with vehicles, limiting new or improved access to areas previously inaccessible through closure or rehabilitation of access roads not needed after construction, and reclamation of construction areas.

Variations S1-B1 and S1-B2

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Wolf use areas do not occur in study corridors of Design Options 1, 2, and 3; therefore, no identifiable impacts from the design options are anticipated on wolf use areas.

East Bombing Range Road Alternative

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Wolf use areas do not occur in the study corridors of Design Options 1, 2, and 3; therefore, no identifiable impacts are anticipated on wolf use areas.

West of Bombing Range Road – Southern Route Alternative

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Wolf use areas do not occur in the study corridors of Design Options 1, 2, and 3; therefore, no identifiable impacts are anticipated on wolf use areas.

Longhorn Alternative

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S1-A1 and S1-A2

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

The types of potential effects on gray wolf, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on gray wolf would be the same as those described for the Applicant's Proposed Action Alternative.

Other Special Status Species

Alternative Routes and Route Variations

The amount of each wildlife habitat type that would be disturbed in Segment 1 is compared by alternative in Table 3-120 in Section 3.2.3. Special status species using wildlife habitats in Segment 1 are described at the beginning of Section 3.2.4.5. Potential effects on special status wildlife species would be similar to potential effects on other wildlife species that use the same habitat types. The types of potential effects on each wildlife habitat type are described in detail in Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on special status wildlife include installing devices to deter raptor perching on transmission line structures and minimize an increase in predation, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, conducting preconstruction surveys, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

The types of potential effects on special status wildlife species would be similar for all alternatives. Because mortality of special status species (without population-level effects) and temporary disturbance during critical or sensitive periods could occur (without population-level effects), the Applicant's Proposed Action and all alternatives in Segment 1 could result in long-term moderate impacts on special status species. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Washington Ground Squirrel

Table 3-168 presents miles crossed and residual impacts on Washington ground squirrel for all alternative routes and route variations in Segment 1. Levels of residual impacts and duration of impacts on Washington ground squirrel are described by alternative route and route variation below, and displayed in MV-8. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-168. Washington Ground Squirrel Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Inventory[1]				Residual Impacts[2]	
	Total Length (miles)	Occupied Colony Avoidance Areas	Occupied Colony Dispersal Areas	Suitable Habitat	High	Moderate
Applicant's Proposed Action	91.9	0.1	5.9	12.5	6.0	12.5
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.4	2.8	8.4	3.2	8.4
Applicant's Proposed Action – Southern Route[3]	99.1	0.1	5.9	13.5	6.0	13.5
West of Bombing Range Road – Southern Route[3]	95.6	0.0	3.8	13.9	3.8	13.9
Longhorn	88.2	0.4	3.9	6.2	4.3	6.2

Table 3-168. Washington Ground Squirrel Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Inventory[1]				Residual Impacts[2]	
	Total Length (miles)	Occupied Colony Avoidance Areas	Occupied Colony Dispersal Areas	Suitable Habitat	High	Moderate
Interstate 84[3]	84.7	0.0	0.0	4.9	0.0	4.9
Variation S1-A1[3]	*18.5*	*0.0*	*0.0*	*1.0*	*0.0*	*1.0*
Variation S1-A2[3]	*18.5*	*0.0*	*0.0*	*11.0*	*0.0*	*11.0*
Interstate 84 – Southern Route[3]	93.4	0.0	0.0	6.0	0.0	6.0

Table Notes
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]Low levels of impacts on Washington ground squirrel are not anticipated as a result of B2H Project implementation.
[3]Portions of this route that cross Washington ground squirrel suitable habitat were not surveyed for colonies.

Table 3-169 displays acreage of disturbance on Washington ground squirrel habitat types for each of the alternative routes and variations. The percentage of the right-of-way that intersects each habitat type represents indirect effects on Washington ground squirrel.

Table 3-169. Anticipated Acres of Disturbance and Percent of Right-of-Way with Habitat for Washington Ground Squirrel for Segment 1—Morrow-Umatilla

Alternative Route	Total Acres within Right-of-Way	Total Acres of Disturbance	Occupied Colony Avoidance Areas		Occupied Colony Dispersal Areas		Suitable Habitat	
			Acres of Disturbance	Percent of Right-of-Way with Habitat	Acres of Disturbance	Percent of Right-of-Way with Habitat	Acres of Disturbance	Percent of Right-of-Way with Habitat
Applicant's Proposed Action	2,784	1,907	2[1]	0.1	122	5.3	259	14.1
Variation S1-B1	*195*	*142*	*0*	*None*	*0*	*None*	*0*	*None*
Variation S1-B2	*195*	*136*	*0*	*None*	*0*	*None*	*0*	*None*
East of Bombing Range Road	2,793	1,913	8	0.5	58	3.0	174	9.7
Applicant's Proposed Action – Southern Route	3,005	2,090	2[1]	0.1	124	4.9	284	13.9
West of Bombing Range Road – Southern Route	2,898	2,111	0[1]	<0.1	84	3.0	307	15.4
Longhorn	2,676	1,867	8	0.4	82	4.4	131	7.1

Table 3-169. Anticipated Acres of Disturbance and Percent of Right-of-Way with Habitat for Washington Ground Squirrel for Segment 1—Morrow-Umatilla

Alternative Route	Total Acres within Right-of-Way	Total Acres of Disturbance	Occupied Colony Avoidance Areas		Occupied Colony Dispersal Areas		Suitable Habitat	
			Acres of Disturbance	Percent of Right-of-Way with Habitat	Acres of Disturbance	Percent of Right-of-Way with Habitat	Acres of Disturbance	Percent of Right-of-Way with Habitat
Interstate 84	2,569	1,784	0	None	0	None	103	5.9
Variation S1-A1	*563*	*360*	*0*	*None*	*0*	*None*	*19*	*5.8*
Variation S1-A2	*562*	*408*	*0*	*None*	*0*	*None*	*242*	*60.0*
Interstate 84 – Southern Route	2,833	1,989	0	None	0	None	128	6.4

Table Notes:
[1]Disturbance from portions of routes that are adjacent to, but do not cross, habitat is not represented here, as disturbance was calculated using estimated density of disturbance (in acres per mile) for length of habitat crossed (refer to Additional Analysis in Section 3.2.4.4 for a detailed explanation of disturbance calculations)
Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would have high and moderate residual impacts on Washington ground squirrel. Short-term high residual impacts on Washington ground squirrel from the Applicant's Proposed Action Alternative would result from potential mortality to individuals. Permanent high residual impacts would result from permanent loss and/or modification of occupied colony dispersal areas. Permanent moderate residual impacts would result from permanent loss and/or modification of suitable habitat. Anticipated acres of disturbance to occupied colony avoidance areas and occupied colony dispersal areas and suitable habitat are presented in Table 3-169. Along with the disturbance to Washington ground squirrel habitat expected from Applicant's Proposed Action Alternative, indirect effects are anticipated on Washington ground squirrel across the Applicant's Proposed Action Alternative right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each route.

The types of potential effects on Washington ground squirrel are described in detail in Section 3.2.4.6. In addition to the types of impacts from construction, operation, and maintenance that are common to all alternatives that cross occupied and suitable Washington ground squirrel habitat, short-term high residual impacts from the Applicant's Proposed Action Alternative would result from surveys and excavation for unexploded ordnances that would be required prior to construction on portions of the route located inside the eastern boundary of the NWSTF Boardman, including on the NWSTF Boardman's Washington ground squirrel Resource Management Area. This additional disturbance could increase impacts on Washington ground squirrel, including additional mortality and burrow destruction from ground disturbance and heavy equipment operation.

Washington ground squirrel habitat crossed by the Applicant's Proposed Action Alternative on the NWSTF Boardman is likely to have previously incurred some of the B2H Project's potential impacts from construction and maintenance of the existing transmission line. In particular, potential for raptor perching and nesting on transmission line structures already exists; however, the proposed transmission line towers would be taller than the existing towers and could result in increased raptor predation compared to current levels of predation.

Impacts on Washington ground squirrel from military readiness activities on the NWSTF Boardman were assessed in an EIS and the Navy developed conservation measures for Washington ground squirrel in coordination with the USFWS (Navy 2015). The contribution the B2H Project's impacts on Washington ground squirrel inhabiting the NWSTF Boardman in conjunction with those from Navy activities are discussed in the cumulative effects analysis in Section 3.3.4.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Washington ground squirrel are listed in Table 3-140 and include conducting preconstruction surveys, installing devices to deter raptor perching on transmission line structures, avoiding occupied colony avoidance areas through spanning and/or micro-siting, implementing seasonal and spatial restrictions, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

Occupied colony avoidance areas (i.e., Category 1 habitat) would be avoided, as required by the Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0000), the goals and standards of which must be followed to comply with the Oregon EFSC's fish and wildlife habitat standards (OAR 345-022-0060). As per the Fish and Wildlife Habitat Mitigation Policy, compensatory mitigation would be required for B2H Project disturbance in Category 2 Washington ground squirrel habitat (i.e., occupied colony dispersal areas). The mitigation goal for Category 2 habitat is no net loss of either predevelopment habitat quantity or quality, and to provide a net benefit of habitat quantity or quality. The mitigation strategy is in-kind, in-proximity mitigation The Washington ground squirrel Resource Management Area on the NWSTF Boardman, which is considered an avoidance area by the Navy, would not be avoided by the Applicant's Proposed Action, though impacts would be minimized through the protective measures and compensatory mitigation described above.

Variations S1-B1 and S1-B2

The variations do not cross occupied or suitable Washington ground squirrel habitat; therefore, no identifiable impacts on Washington ground squirrel would be anticipated from the variations.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 would have high and moderate residual impacts on Washington ground squirrel. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Design Option 1, but not Design Options 2 and 3, crosses the Washington ground squirrel Resource Management Area on the NWSTF Boardman; impacts on Washington ground squirrel on the NWSTF Boardman and the Resource Management Area from Design Option 1 would be the same as those described for the Applicant's Proposed Action Alternative. The types of potential

effects on Washington ground squirrel are described in detail under Types of Potential Effects. The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as that described for the Applicant's Proposed Action Alternative.

East Bombing Range Road Alternative

The East of Bombing Range Road Alternative would have high and moderate residual impacts on Washington ground squirrel. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to occupied colony avoidance areas and occupied colony dispersal areas and suitable habitat are presented in Table 3-169. Along with the direct effects from the footprint of the route, indirect effects are anticipated on Washington ground squirrel across the right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each alternative and variation.

The types of potential effects on Washington ground squirrel are described in detail at the beginning of Section 3.2.4.6 and are similar to those described for the Applicant's Proposed Action Alternative. However, the East of Bombing Range Road Alternative would not have the additional impacts on Washington ground squirrel as those described for the Proposed Action where it crosses the NWSTF Boardman. The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as that described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative would have high and moderate residual impacts on Washington ground squirrel. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to occupied colony avoidance areas and occupied colony dispersal areas and suitable habitat are presented in Table 3-169.

The types of potential effects on Washington ground squirrel are described in detail at the beginning of Section 3.2.4.6. This alternative would have the same additional impacts as discussed for the Applicant's Proposed Action Alternative where it crosses the NWSTF Boardman and the NWSTF Boardman's Washington ground squirrel Resource Management Area. The Washington ground squirrel suitable habitat crossed by the portion of this route that deviates from the Applicant's Proposed Action Alternative has not been surveyed for Washington ground squirrel colonies; additional high residual impacts would result from this portion of the route if active colonies are identified in preconstruction surveys. Along with the direct effects from the footprint of the route, indirect effects are anticipated on Washington ground squirrel across the right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each alternative and variation.

The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Impacts on Washington ground squirrel from Design Options 1, 2, and 3 would be the same as those described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative would have high and moderate residual impacts on Washington ground squirrel. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to occupied colony avoidance areas and occupied colony dispersal areas and suitable habitat are presented in Table 3-169.

The types of potential effects on Washington ground squirrel are described in detail at the beginning of Section 3.2.4.6. This alternative would have the same additional impacts as discussed for the Applicant's Proposed Action Alternative where it crosses the NWSTF Boardman and the NWSTF Boardman's Washington ground squirrel Resource Management Area. The Washington ground squirrel suitable habitat crossed by the portion of this route that deviates from the Applicant's Proposed Action Alternative has not been surveyed for Washington ground squirrel colonies; additional high residual impacts would result from this portion of the route if active colonies are identified in preconstruction surveys. Along with the direct effects from the footprint of the route, indirect effects are anticipated on Washington ground squirrel across the right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each alternative and variation.

The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as that described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Impacts on Washington ground squirrel from Design Options 1, 2, and 3 would be the same as those described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Longhorn Alternative would have high and moderate residual impacts on Washington ground squirrel. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to occupied colony avoidance areas and occupied colony dispersal areas and suitable habitat are presented in Table 3-169.

The types of potential effects on Washington ground squirrel are described in detail at the beginning of Section 3.2.4.6. The Longhorn Alternative would not have the additional impacts on Washington ground squirrel described for the Applicant's Proposed Action where it crosses the NWSTF Boardman. Along

with the direct effects from the footprint of the route, indirect effects are anticipated on Washington ground squirrel across the right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each alternative and variation.

The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as those described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

The Interstate 84 Alternative would have moderate residual impacts on Washington ground squirrel (MV-8, Table 3-168). Permanent moderate residual impacts would result from permanent loss and/or modification of suitable habitat. Anticipated acres of disturbance to Washington ground squirrel habitat are presented in Table 3-169.

The types of potential effects on Washington ground squirrel are described in detail at the beginning of Section 3.2.4.6 The Interstate 84 Alternative would not have the additional impacts on Washington ground squirrel described for the Applicant's Proposed Action where it crosses the NWSTF Boardman. The Washington ground squirrel suitable habitat crossed by this route has not been surveyed for Washington ground squirrel colonies; additional high residual impacts would result from this route if active colonies are identified in preconstruction surveys. Along with the direct effects from the footprint of the route, indirect effects are anticipated on Washington ground squirrel across the right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each alternative and variation.

The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as that described for the Applicant's Proposed Action Alternative.

Variations S1-A1 and S1-A2

The variations would have moderate residual impacts on Washington ground squirrel (MV-8, Table 3-168). Permanent moderate residual impacts would result from permanent loss and/or modification of suitable habitat. Anticipated acres of disturbance to Washington ground squirrel habitat are presented in Table 3-169.

The types of potential effects on Washington ground squirrel are described in detail at the beginning of Section 3.2.4.6. The Washington ground squirrel suitable habitat crossed by this route has not been surveyed for Washington ground squirrel colonies; additional high residual impacts would result from this route if active colonies are identified in preconstruction surveys. Along with the direct effects from the footprint of the route variation, indirect effects are anticipated on Washington ground squirrel across the right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each alternative and variation.

The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as that described for the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative would have moderate residual impacts on Washington ground squirrel (MV-8, Table 3-168). Permanent moderate residual impacts would result from permanent loss and/or modification of suitable habitat. Anticipated acres of disturbance to occupied colony avoidance areas and occupied colony dispersal areas and suitable habitat are presented in Table 3-169.

The types of potential effects on Washington ground squirrel are described in detail at the beginning of Section 3.2.4.6. The Interstate 84 – Southern Route Alternative would not have the additional impacts on Washington ground squirrel described for the Applicant's Proposed Action where it crosses the NWSTF Boardman. The Washington ground squirrel suitable habitat crossed by this route has not been surveyed for Washington ground squirrel colonies; additional high residual impacts would result from this portion of the route if active colonies are identified in preconstruction surveys. Along with the direct effects from the footprint of the route, indirect effects are anticipated on Washington ground squirrel across the right-of-way; Table 3-169 presents the percentage of the right-of-way that intersects the different Washington ground squirrel habitat types for each alternative and variation.

The design features of the B2H Project for environmental protection, selective mitigation measures, and compensatory mitigation that would minimize impacts from the B2H Project on Washington ground squirrel would be the same as that described for the Applicant's Proposed Action Alternative.

Migratory Birds Including Raptors

Applicant's Proposed Action Alternative

Direct impacts on raptors and other migratory birds during construction could include collision with B2H Project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. The risk of migratory bird collision is potentially higher for the Applicant's Proposed Action Alternative and other alternative routes that cross Boardman Grasslands Important Bird Areas compared to other alternative routes due to the concentrated bird activity in these areas. The risk of collision risk already exists from the existing transmission line located along the route of the Applicant's Proposed Action Alternative; however, the risk of collision may be greater due to the increased size of the proposed transmission line towers. Raptors and other migratory birds are particularly sensitive to disturbance during the nesting period and some construction activities could cause nest failure or abandonment. The types of potential effects on raptors and other migratory birds are described in detail at the beginning of Section 3.2.4.6.

Residual impact levels for raptors and other migratory birds have been determined in accordance with the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4. Because removal or disturbance to nesting sites for raptors and

other migratory birds could occur, the Applicant's Proposed Action could result in long-term moderate residual impacts on raptors and other migratory birds. Short-term moderate residual impacts on bald and golden eagles would result from disruption of breeding and foraging behavior. Short-term moderate impacts from disturbance of nesting sites could occur if nests are located along the Applicant's Proposed Action during preconstruction surveys; no nests are currently known to occur within 0.5-mile of the Applicant's Proposed Action Alternative.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on raptors and other migratory birds include installing flight diverters, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, and conducting preconstruction surveys (refer to Section 3.2.4.4). In addition, adherence to the Applicant's Avian Protection Plan would minimize or avoid impacts from the B2H Project on raptors and other migratory birds.

Variations S1-B1 and S1-B2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Residual impact levels and duration of impacts, as well as the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the Design Options 1, 2, and 3 on raptors and other migratory birds would be similar to those described for the Applicant's Proposed Action Alternative. The types of potential effects on raptors and other migratory birds are described in detail at the beginning of Section 3.2.4.6.

East Bombing Range Road Alternative

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative. Similar to the Applicant's Proposed Action Alternative, the risk of migratory bird collision is potentially high for the East of Bombing Range Road Alternative because concentrated bird activity occurs within the study corridor on the Boardman Grasslands Important Bird Areas. However, the risk of new collision risk would be reduced as compared to the Applicant's Proposed Action in the areas where it is colocated with an existing transmission line.

Applicant's Proposed Action – Southern Route Alternative

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that

would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative. Similarly to the Applicant's Proposed Action Alternative, the risk of migratory bird collision is potentially higher for the Applicant's Proposed Action – Southern Route Alternative because it crosses areas of concentrated bird activity on the Boardman Grasslands Important Bird Areas. The risk of collision risk already exists from the existing transmission line located along the route of the Applicant's Proposed Action – Southern Route Alternative; however, the risk of collision may be greater due to the increased size of the proposed transmission line towers.

Additional Action – 69-Kilovolt Line Replacement

Impacts from Design Option 1, 2, and 3 on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative. Similarly to the Applicant's Proposed Action Alternative, the risk of migratory bird collision is potentially higher for the West of Bombing Range Road – Southern Route Alternative because it crosses areas of concentrated bird activity on the Boardman Grasslands Important Bird Areas. The risk of collision risk already exists from the existing transmission line located along the route of the West of Bombing Range Road – Southern Route Alternative; however, the risk of collision may be greater due to the increased size of the proposed transmission line towers.

Additional Action – 69-Kilovolt Line Replacement

Impacts from Design Option 1, 2, and 3 on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative. Similar to the Applicant's Proposed Action Alternative, the risk of migratory bird collision is potentially high for the Longhorn Alternative because concentrated bird activity occurs within the study corridor on the Boardman Grasslands Important Bird Areas.

Interstate 84 Alternative

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative. However, the risk of migratory bird

collision may be lower for the Interstate 84 Alternative because the Boardman Grasslands Important Bird Areas occur within a relatively small portion of the study corridor at the western end of the alternative route.

Variations S1-A1 and S1-A2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Interstate 84 Alternative. However, the risk of new collision risk would be reduced for Variation S1-A2 as it is colocated with an existing transmission line.

Interstate 84 – Southern Route Alternative

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Interstate 84 Alternative.

Big Game

The direct and indirect effects of the B2H Project on big game species could incrementally contribute to other factors preventing mule deer and elk populations from meeting ODFW's management objectives for these species. However, as described below, design features of the B2H Project for environmental protection and selective mitigation measures will minimize impacts on WMUs and big game habitat.

Table 3-170 presents miles crossed and residual impacts on big game for all alternative routes and route variations in Segment 1. Levels of residual impacts and duration of impacts on big game are described by alternative route and route variation below, and displayed in MV-10. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-170. Big Game Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]					Residual Impacts[2]
		Bighorn Sheep Oregon Occupied Range	Bighorn Sheep Population Management Units	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range	Low
Applicant's Proposed Action	91.9	0.0	0.0	0.0	9.1	14.5	14.5
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.4*	*0.7*	*0.7*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.4*	*1.2*	*1.2*
East of Bombing Range Road	92.3	0.0	0.0	0.0	9.1	14.5	14.5

Table 3-170. Big Game Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]					Residual Impacts[2]
		Bighorn Sheep Oregon Occupied Range	Bighorn Sheep Population Management Units	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range	Low
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	0.0	20.2	19.9	25.4
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	0.0	46.5	19.9	51.7
Longhorn	88.2	0.0	0.0	0.0	9.1	14.5	14.5
Interstate 84	84.7	0.0	0.0	0.0	9.1	14.5	14.5
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	0.0	0.0	20.2	19.9	25.4

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High or moderate levels of impacts on Big Game are not anticipated as a result of B2H Project implementation.

Table 3-171 displays acreage of disturbance on big game habitat for all alternatives and variations in Segment 1.

Table 3-171. Anticipated Acres of Disturbance for Big Game for Segment 1—Morrow-Umatilla (acres)

Alternative Route	Total Disturbance	Bighorn Sheep Oregon Occupied Range	Bighorn Sheep Population Management Units	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range
Applicant's Proposed Action	1,907	0	0	0	189	301
Variation S1-B1	*142*	*0*	*0*	*0*	*9*	*15*
Variation S1-B2	*136*	*0*	*0*	*0*	*9*	*26*
East of Bombing Range Road	1,913	0	0	0	189	301
Applicant's Proposed Action – Southern Route	2,090	0	0	0	426	419
West of Bombing Range Road – Southern Route	2,111	0	0	0	1,027	439
Longhorn	1,867	0	0	0	192	307
Interstate 84	1,784	0	0	0	191	305
Variation S1-A1	*360*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*408*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	1,989	0	0	0	430	423

Table Notes: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have short- and long-term low residual impacts on mule deer and elk. Anticipated acres of disturbance to mule deer and elk winter range are presented in Table 3-171. Short- and long-term residual impacts from the Applicant's Proposed Action would be low because impacts would have only minor adverse effects on mule deer and elk and would not limit the long-term sustainability of populations.

Direct effects on big game could include vehicle collisions, noise and visual disturbance, and habitat loss and modification. Indirect effects could include increased disturbance to big game from increased human activity from use of new or improved access roads. The types of potential effects on big game are described in detail at the beginning of Section 3.2.4.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project to big game are listed in Table 3-140 and include implementing seasonal restrictions, limiting new or improved access to areas previously inaccessible, leaving vegetation in place whenever possible, and reclaiming construction areas with an agency or landowner-approved seed mix (refer to Section 3.2.4.4).

Variations S1-B1 and S1-B2

The variations would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross designated mule deer or elk winter range; therefore, no identifiable impacts would be anticipated on these habitat types.

East Bombing Range Road Alternative

The East of Bombing Range Road Alternative would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross designated mule deer or elk winter range; therefore, no identifiable impacts would be anticipated on these habitat types.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3 do not cross designated mule deer or elk winter range; therefore, no identifiable impacts would be anticipated on these habitat types.

Longhorn Alternative

The Longhorn Alternative would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

The Interstate 84 Alternative would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S1-A1 and S1-A2

The variations do not cross mule deer or elk winter range; therefore, no identifiable impacts would be anticipated on these habitat types.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Management Indicator Species and USFS Sensitive Species

Alternative Routes and Route Variations

The environmental consequences for MIS and USFS sensitive species are described in Appendix F.

Conclusion

All alternative routes and route variations would result in short-term, long-term, and permanent effects on wildlife habitat and wildlife species. A summary of effects on gray wolf, Washington ground squirrel, migratory birds including raptors, and big game are provided below.

Gray Wolf

The West of Bombing Range Road – Southern Route would have the greatest impact on gray wolves compared to the other alternative routes in Segment 1 because ODFW-designated wolf use areas where the gray wolf retains federally endangered status occur in the West of Bombing Range Road – Southern Route study corridor. ODFW-designated wolf use areas where the gray wolf retains federally endangered status do not occur in the study corridors of the other alternative routes.

The B2H Project would have high and moderate residual impacts on gray wolves with federally endangered status. Mortality of gray wolves and disturbance or displacement from habitat would be substantially minimized by limiting the extent of construction activities, enforcement of a speed limit, and limiting public accessibility of new or improved access roads. Disturbance or displacement from habitat is not anticipated to negatively affect gray wolves appreciably due to the small amount of habitat affected compared to the large home ranges of this species.

Washington Ground Squirrel

All alternative routes would result in moderate residual impacts from crossing Washington ground squirrel suitable habitat. In addition, all alternative routes would result in high residual impacts from crossing Washington ground squirrel occupied colony avoidance areas and/or occupied colony dispersal areas, with the exception of the Interstate 84 Alternative and the Interstate 84 – Southern Route Alternative, which have not been surveyed for colonies and may or may not contain active colonies. In addition to other direct and indirect effects, permanent loss and/or modification of Washington ground squirrel occupied colony dispersal areas and suitable habitat would occur where these habitat types are crossed by the alternative routes. Loss and modification of habitat in occupied colony avoidance areas would be avoided through spanning and/or micro-siting.

Impacts on Washington ground squirrel would be greatest from the Applicant's Proposed Action – Southern Route; the Applicant's Proposed Action – Southern Route crosses the same amount of occupied habitat (i.e., occupied colony avoidance areas and occupied colony dispersal areas) as the Applicant's Proposed Action, including the Washington ground squirrel Resource Management Area (all of which is considered an avoidance area by the Navy), but the Applicant's Proposed Action – Southern Route crosses more suitable habitat. The Interstate 84 Alternative would result in the lowest impacts on Washington ground squirrel as it does not cross occupied habitat and crosses the smallest amount of suitable habitat. However, the suitable habitat crossed by Interstate 84 has not been surveyed for colonies; but even if surveys determine that all of the suitable habitat crossed by the Interstate 84 Alternative is occupied habitat, the Applicant's Proposed Action and Applicant's Proposed Action – Southern Route would still be expected to have greater impacts on Washington ground squirrel since

the total amount of occupied habitat that the two alternatives cross is greater than the amount of suitable habitat crossed by the Interstate 84 Alternative.

Impacts on Washington ground squirrel would be reduced through limiting the extent of construction activities, use of existing access, enforcement of a speed limit, installation of devices to deter raptor perching, B2H Project activity restrictions during sensitive periods, and reclamation; moreover, compensatory mitigation that provides a net benefit of habitat quantity or quality would be required for surface disturbance in occupied colony dispersal areas (per the ODFW Fish and Wildlife Habitat Mitigation Policy).

Migratory Birds Including Raptors

All alternative routes and route variations would result in moderate residual impacts on raptors and other migratory birds from removal or disturbance to nesting sites, and from the disruption of bald and golden eagle breeding and foraging behavior. Avoidance and minimization measures, including limiting B2H Project activities and implementing spatial restrictions during the nesting season, would reduce impacts on migratory birds during construction and operation of the B2H Project. Removal of and disturbance to nesting habitat would not negatively affect raptors and other migratory birds appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Habitat disturbed during construction would be reclaimed and would restore migratory bird habitats similar to those disturbed. While the resulting habitats may cause a shift in avian species use, population-level effects on migratory birds are not anticipated to occur.

Impacts on migratory bird habitat would be greater with the Applicant's Proposed Action Alternative, Applicant's Proposed Action – Southern Route Alternative, and West of Bombing Range Road – Southern Route Alternative from crossing the Boardman Grasslands Important Bird Areas, compared to the other alternative routes which do not cross any Important Bird Areas. No bald or golden eagle nests are known to occur within 0.5 mile of any alternative route or route variation.

Big Game

All alternative routes would have low residual impacts on big game. In addition to other direct and indirect effects, short- and long-term habitat loss would occur, but would not negatively affect big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Disturbance to big game during sensitive periods would be minimized through the implementation of seasonal restrictions. The Applicant's Proposed Action Alternative, Longhorn Alternative, East of Bombing Range Road Alternative, and the Interstate 84 Alternative share an alignment where they cross big game habitat and would have the lowest impacts from crossing less big game habitat than the other alternative routes.

Summary

The Interstate 84 Alternative would result in the least overall impacts on wildlife resources compared to the other alternative routes in Segment 1 primarily because it would result in the least impacts on Washington ground squirrel. The Interstate 84 Alternative would also avoid the ODFW-designated wolf use areas where the gray wolf retains federally endangered status, avoid impacts on migratory birds

associated with crossing the Boardman Grasslands Important Bird Areas, and would cross less big game habitat than the West of Bombing Range Road – Southern Route and the Interstate 84–Southern Route.

SEGMENT 2—BLUE MOUNTAINS

Wildlife Habitat

Alternative Routes and Route Variations

Wildlife habitat that would be affected in Segment 2 includes woodland/forest and shrubland habitat, as well as RCAs. Grassland habitat also would be affected, but to a more limited extent. The amount of wildlife habitat types that would be disturbed in Segment 2 is compared by alternative route in Table 3-123, and residual impacts on each wildlife habitat type is provided in Table 3-122 in Section 3.2.3. Additionally, wildlife habitat on the Ladd Marsh Wildlife Area, as well as Rebarrow Forest, Winn Meadow, and other lands west of Ladd Marsh Wildlife Area would be affected by central portions of the routes in Segment 2.

The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6. The primary impact on wildlife habitats would include habitat removal and fragmentation. The Applicant's Proposed Action and all alternatives and variations in Segment 2 would result in moderate residual impacts on shrubland and forest/woodland habitat types because they support a wide range of species and are slow to regenerate. Native grassland habitats provide value to wildlife but are uncommon throughout the B2H Project area, therefore, the Applicant's Proposed Action and all alternatives and variations in Segment 2 would result in moderate residual impacts on this habitat type. Although disturbance to RCAs is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible (Design Features 15 and 16), the B2H Project in Segment 2 would have moderate residual impacts on this valuable wildlife habitat type.

Special Status species

Alternative Routes and Route Variations

The amount of each wildlife habitat that would be disturbed in Segment 2 is compared by alternative in Table 3-123 in Section 3.2.3. Special status species using wildlife habitats in Segment 2 are described at the beginning of Section 3.2.4.5. Potential effects on special status wildlife species would be similar to potential effects on other wildlife species that use the same habitat types. The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on special status wildlife include installing devices to deter raptor perching on transmission line structures and minimize an increase in predation, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive

periods and habitats, conducting preconstruction surveys, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

The types of potential effects on special status wildlife species would be similar for all alternatives. Because mortality of special status species (without population-level effects) and temporary disturbance during critical or sensitive periods could occur (without population-level effects), the Applicant's Proposed Action and all alternatives and variations in Segment 2 could result in long-term moderate impacts on special status species. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Greater Sage-Grouse

Table 3-172 presents miles crossed and residual impacts on Greater Sage-Grouse PHMA and GHMA for all alternative routes and route variations in Segment 2. Levels of residual impacts and duration of impacts on Greater Sage-Grouse are described by alternative route and route variation below, and displayed in MV-9. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-172. Greater Sage-Grouse Inventory Data and Residual Impacts for Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length (miles)	Inventory (Miles Crossed)[1]		Residual Impacts (miles crossed)[2]	
		Priority Habitat Management Areas	General Habitat Management Areas	High	Moderate
Applicant's Proposed Action	33.8	0.0	3.2	0.0	3.2
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*3.2*	*0.0*	*3.2*
Variation S2-F2	*12.2*	*0.0*	*1.9*	*0.0*	*1.9*
Glass Hill	33.7	0.0	3.2	0.0	3.2
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	0.0	1.9	0.0	1.9

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]Low levels of impacts on Greater Sage-Grouse are not anticipated as a result of B2H Project implementation.

Table 3-173 displays acreage of disturbance on Greater Sage-Grouse habitat types for each of the route alternatives and variations.

Table 3-173. Anticipated Acres of Disturbance for Greater Sage-Grouse for Segment 2—Blue Mountains			
Alternative Route	**Total Acres of Disturbance**	**Priority Habitat Management Areas**	**General Habitat Management Areas**
Applicant's Proposed Action	764	0	73
Variation S2-A1	*58*	*0*	*0*
Variation S2-A2	*60*	*0*	*0*
Variation S2-B1	*85*	*0*	*0*
Variation S2-B2	*85*	*0*	*0*
Variation S2-C1	*221*	*0*	*0*
Variation S2-C2	*191*	*0*	*0*
Variation S2-E1	*52*	*0*	*0*
Variation S2-E2	*58*	*0*	*0*
Variation S2-F1	*260*	*0*	*69*
Variation S2-F2	*266*	*0*	*41*
Glass Hill	752	0	72
Variation S2-D1	*109*	*0*	*0*
Variation S2-D2	*98*	*0*	*0*
Mill Creek	784	0	44
Table Notes: Greater Sage-Grouse habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.			

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have long-term moderate residual impacts on Greater Sage-Grouse. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-173.

Potential direct effects on Greater Sage-Grouse could include mortality due to electrocution; in-flight collisions with transmission line infrastructure; collisions with construction and maintenance vehicles; fragmentation of habitats due to the introduction of tall structures, increased EMFs, and construction of new roads; loss and degradation of habitat quality and function; disturbance to breeding activities due to increased human presence and noise at lek locations; disturbance during sensitive periods resulting from human presence, vehicle use, and noise during construction and maintenance; and interruption and/or alteration of seasonal migrations and movements among populations. Along with the direct effects that would be expected within the footprint of the Applicant's Proposed Action Alternative, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 16.5 percent would be in Greater Sage-Grouse GHMA. Indirect effects in these areas could include alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds; avoidance of habitat due to potential increase in raptor predation pressure; disruption of nesting and breeding activities and avoidance of habitat due to vehicle

noise and human presence resulting from public use of new access roads; increased mammalian predation risk; increased raptor and raven predation risk; and alteration of behavioral patterns due to increased predation pressure. The types of potential direct and indirect effects on Greater Sage-Grouse are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Greater Sage-Grouse are listed in Table 3-140 and include installing devices to deter raptor perching on transmission line structures, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), conducting preconstruction surveys, implementing seasonal restrictions for sensitive periods and habitats, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4). Seasonal restrictions for Greater Sage-Grouse would be similar to the seasonal restrictions identified in the Oregon ARMPAs (refer to Appendix B). Moreover, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

Variations S2-A1 and S2-A2

The variations do not cross Greater Sage-Grouse habitat; therefore, no identifiable impacts on Greater Sage-Grouse would be anticipated.

Variation S2-B1 and S2-B2

The variations do not cross Greater Sage-Grouse habitat; therefore, no identifiable impacts on Greater Sage-Grouse would be anticipated.

Variation S2-C1 and S2-C2

The variations do not cross Greater Sage-Grouse habitat; therefore, no identifiable impacts on Greater Sage-Grouse would be anticipated.

Variations S2-E1 and S2-E2

The variations would have long-term moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-173.

Along with the direct effects that would be expected within the footprint of the variations, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 0.3 percent would be Greater Sage-Grouse GHMA. Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S2-F1

Variation S2-F1 would have long-term moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-173.

Along with the direct effects that would be expected within the footprint of Variation S2-F1, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 37.0 percent would be Greater Sage-Grouse GHMA. Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S2-F2

Variation S2-F2 would have long-term moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-173.

Along with the direct effects that would be expected within the footprint of Variation S2-F2, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 39.4 percent would be Greater Sage-Grouse GHMA and less than 0.1 percent would be PHMA on the Baker Oregon PAC. Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Glass Hill Alternative

The Glass Hill Alternative would have long-term moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-173.

Along with the direct effects that would be expected within the footprint of the Glass Hill Alternative, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 16.6 percent would be Greater Sage-Grouse GHMA. Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

The variations do not cross Greater Sage-Grouse habitat; therefore, no identifiable impacts on Greater Sage-Grouse would be anticipated.

Mill Creek Alternative

The Mill Creek Alternative would have long-term moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-173.

Along with the direct effects that would be expected within the footprint of the Mill Creek Alternative, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 17.4 percent would be Greater Sage-Grouse GHMA and 0.3 percent would be PHMA on the Baker Oregon PAC. Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Migratory Birds Including Raptors

Applicant's Proposed Action Alternative

Direct impacts on raptors and other migratory birds during construction could include collision with B2H Project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. Raptors and other migratory birds are particularly sensitive to disturbance during the nesting period and some construction activities could cause nest failure or abandonment. The types of potential effects on raptors and other migratory birds are described in detail at the beginning of Section 3.2.4.6.

Residual impact levels for raptors and other migratory birds have been determined in accordance with the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4. Because removal or disturbance to nesting sites for raptors and other migratory birds could occur, the Applicant's Proposed Action could result in long-term residual moderate impacts on raptors and other migratory birds. Short-term moderate residual impacts on bald and golden eagles would result from disruption of breeding and foraging behavior. Short-term moderate impacts from disturbance of nesting sites could occur if nests are located along the Applicant's Proposed Action during preconstruction surveys; no nests are currently known to occur within 0.5-mile of the Applicant's Proposed Action Alternative.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on raptors and other migratory birds include installing flight diverters, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, and conducting preconstruction surveys (refer to Section 3.2.4.4). In addition, adherence to the Applicant's Avian Protection Plan would minimize or avoid impacts from the B2H Project on raptors and other migratory birds.

Variations S2-A1 and S2-A2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S2-B1 and S2-B2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

The risk of increased collision may be somewhat reduced for Variation S2-B2 compared to Variation S2-B1 because this risk already exists from the existing transmission line located along the route of Variation S2-B2.

Variations S2-C1 and S2-C2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

The risk of migratory bird collision is potentially higher for Variation S2-C2 than Variation S2-C1 because it crosses areas of concentrated bird activity on the Ladd Marsh Important Bird Areas.

Variations S2-E1 and S2-E2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S2-F1 and S2-F2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that

would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

The risk of increased collision may be somewhat reduced for Variation S2-F2 compared to Variation S2-F1 because this risk already exists from the existing transmission line located along the route of Variation S2-F2.

Glass Hill Alternative

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

The types of potential effects on raptors and other migratory birds, residual impact levels, and the design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Mill Creek Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. However, the risk of migratory bird collision is potentially higher for Mill Creek Alternative than the Applicant's Proposed Action because it crosses areas of concentrated bird activity on the Ladd Marsh Important Bird Areas. The risk of collision risk already exists from the existing transmission line located along the route of the Mill Creek Alternative; however, the risk of collision may be greater due to the increased size of the proposed transmission line towers. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Big Game

The direct and indirect effects of the B2H Project on big game species could incrementally contribute to other factors preventing mule deer and elk populations from meeting ODFW's management objectives for these species. However, as described below, design features of the B2H Project for environmental protection and selective mitigation measures will minimize impacts on WMUs and big game habitat.

Table 3-174 presents miles crossed and residual impacts on big game habitats for all alternative routes and route variations in Segment 2. Levels of residual impacts and duration of impacts on big game are described by alternative route and route variation below, and displayed in MV-10. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-174. Big Game Inventory Data and Residual Impacts for Segment 2—Blue Mountains (miles crossed)				
Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]
		Mule Deer Winter Range	Elk Winter Range	Low
Applicant's Proposed Action	33.8	26.7	29.1	29.1
Variation S2-A1	*2.8*	*2.8*	*2.8*	*2.8*
Variation S2-A2	*2.9*	*2.9*	*2.9*	*2.9*
Variation S2-B1	*3.7*	*3.7*	*3.7*	*3.7*
Variation S2-B2	*3.8*	*3.8*	*3.8*	*3.8*
Variation S2-C1	*9.3*	*5.0*	*7.4*	*7.4*
Variation S2-C2	*8.8*	*5.6*	*6.8*	*6.8*
Variation S2-E1	*2.3*	*2.3*	*2.3*	*2.3*
Variation S2-E2	*2.6*	*2.6*	*2.6*	*2.6*
Variation S2-F1	*12.1*	*9.3*	*9.3*	*9.3*
Variation S2-F2	*12.2*	*10.2*	*10.2*	*10.2*
Glass Hill	33.7	26.6	29.0	29.0
Variation S2-D1	*4.3*	*2.8*	*4.3*	*4.3*
Variation S2-D2	*4.1*	*2.2*	*4.1*	*4.1*
Mill Creek	34.0	32.0	32.0	32.0

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High or moderate levels of impacts on Big Game are not anticipated as a result of B2H Project implementation.

Table 3-175 displays acreage of disturbance on big game habitat for all alternatives and variations in Segment 2.

Table 3-175. Anticipated Acres of Disturbance for Big Game for Segment 2—Blue Mountains (acres)						
Alternative Route	Total Disturbance	Bighorn Sheep Oregon Occupied Range	Bighorn Sheep Management Units	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range
Proposed Action	764	0	0	0	607	662
Variation S2-A1	*58*	*0*	*0*	*0*	*56*	*56*
Variation S2-A2	*60*	*0*	*0*	*0*	*60*	*60*
Variation S2-B1	*85*	*0*	*0*	*0*	*87*	*87*
Variation S2-B2	*85*	*0*	*0*	*0*	*85*	*85*
Variation S2-C1	*221*	*0*	*0*	*0*	*119*	*176*
Variation S2-C2	*191*	*0*	*0*	*0*	*121*	*147*
Variation S2-E1	*52*	*0*	*0*	*0*	*52*	*52*
Variation S2-E2	*58*	*0*	*0*	*0*	*58*	*58*
Variation S2-F1	*260*	*0*	*0*	*0*	*200*	*200*
Variation S2-F2	*266*	*0*	*0*	*0*	*222*	*222*

Table 3-175. Anticipated Acres of Disturbance for Big Game for Segment 2—Blue Mountains (acres)						
Alternative Route	**Total Disturbance**	**Bighorn Sheep Oregon Occupied Range**	**Bighorn Sheep Management Units**	**Pronghorn Winter Range**	**Mule Deer Winter Range**	**Elk Winter Range**
Glass Hill	752	0	0	0	595	649
Variation S2-D1	*109*	*0*	*0*	*0*	*71*	*109*
Variation S2-D2	*98*	*0*	*0*	*0*	*53*	*98*
Mill Creek	784	0	0	0	738	738
Table Note: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.						

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have short- and long-term low residual impacts on mule deer and elk. Anticipated acres of disturbance to mule deer and elk winter range are presented in Table 3-175. Short- and long-term residual impacts from the Applicant's Proposed Action would be low because impacts would have only minor adverse effects on mule deer and elk and would not limit the long-term sustainability of populations.

Direct effects on big game could include vehicle collisions, noise and visual disturbance, and habitat loss and modification. Indirect effects could include increased disturbance to big game from increased human activity from use of new or improved access roads. The types of potential effects on big game are described in detail at the beginning of Section 3.2.4.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project to big game are listed in Table 3-140 and include implementing seasonal restrictions, limiting new or improved access to areas previously inaccessible, leaving vegetation in place whenever possible, and reclaiming construction areas with an agency or landowner-approved seed mix (refer to Section 3.2.4.4).

Variations S2-A1 and S2-A2

The variations would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S2-B1 and S2-B2

The variations would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S2-C1 and S2-C2

The variations would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection,

and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S2-E1 and S2-E2

The variations would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S2-F1 and S2-F2

The variations would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Glass Hill Alternative

The Glass Hill Alternative would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

The variations would have short- and long-term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Mill Creek Alternative

The Mill Creek Alternative would have short- term low residual impacts on mule deer and elk. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Management Indicator Species and USFS Sensitive Species

Alternative Routes and Route Variations

The environmental consequences for MIS and USFS sensitive species are described in Appendix F.

Conclusion

All alternative routes and route variations would result in short-term, long-term, and permanent effects on wildlife habitat and wildlife species. A summary of effects on Greater Sage-Grouse, migratory birds including raptors, and big game are provided below.

Greater Sage-Grouse

All alternative routes cross Greater Sage-Grouse GHMA and would have moderate residual impacts on Greater Sage-Grouse from adverse effects such as loss of habitat, increased avian predation, and habitat avoidance. PHMA would not be crossed by any of the alternative routes and no leks occur within 3.1 miles of any of the alternative routes. In addition to seasonal restrictions implemented during sensitive periods and other avoidance and minimization measures to reduce impacts on Greater Sage-Grouse, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

The Applicant's Proposed Action Alternative and the Glass Hill Alternative share an alignment where they cross GHMA and would have the greatest impact on Greater Sage-Grouse, as more habitat would be crossed as compared to the Mill Creek Alternative.

Migratory Birds Including Raptors

All alternative routes and route variations would result in moderate residual impacts on raptors and other migratory birds from removal or disturbance to nesting sites, and from the disruption of bald and golden eagle breeding and foraging behavior. Avoidance and minimization measures, including limiting B2H Project activities and implementing spatial restrictions during the nesting season, would reduce impacts on migratory birds during construction and operation of the B2H Project. Removal of and disturbance to nesting habitat would not negatively affect raptors and other migratory birds appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Habitat disturbed during construction would be reclaimed and would restore migratory bird habitats similar to those disturbed. While the resulting habitats may cause a shift in avian species use, population-level effects on migratory birds are not anticipated to occur.

Impacts on migratory bird habitat would be greater with the Applicant's Proposed Action Alternative with Variation S2-C2 and the Mill Creek Alternative from crossing the Ladd Marsh Important Bird Areas, compared to the other alternative routes which do not cross any Important Bird Areas. The Mill Creek Alternative would also have the highest impact on bald and golden eagles from crossing within 0.5 and 5 miles of a greater number of bald and golden eagle nests than the other alternative routes.

Big Game

All alternative routes would have low residual impacts on big game. In addition to other direct and indirect effects, short- and long-term habitat loss would occur, but would not negatively affect big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Disturbance to big game during sensitive periods would be minimized through the implementation of seasonal restrictions.

The Applicant's Proposed Action Alternative and the Glass Hill Alternative share an alignment where they cross big game habitat and would have lower impacts from crossing less big game habitat than the Mill Creek Alternative.

Summary

None of the alternative routes considered in Segment 2 would clearly result in the least overall impacts on wildlife resources. The Mill Creek Alternative would result in the least impacts on Greater Sage-Grouse, but would have greater impacts on migratory birds and raptors from crossing the Ladd Marsh Important Bird Areas and crossing within 0.5 and 5 miles of a greater number of bald and golden eagle nests than the other alternative routes. The Mill Creek Alternative also would cross more big game habitat than the other alternative routes, although impacts would not negatively affect big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species.

SEGMENT 3—BAKER VALLEY

Wildlife Habitat

Alternative Routes and Route Variations

The majority of habitat that would be most affected in Segment 3 is shrubland habitat, followed by forest/woodland habitat. RCAs and grassland also would be affected, but to a lesser extent. The amount of wildlife habitat types that would be disturbed by each alternative route in Segment 3 is presented in Table 3-127, and residual impacts on each wildlife habitat type is provided in Table 3-126 in Section 3.2.3.

The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6. The primary impact on wildlife habitats would include habitat removal and fragmentation. The Applicant's Proposed Action and all alternatives and variations in Segment 3 would result in moderate residual impacts on shrubland and forest/woodland habitat types because they support a wide range of species and are slow to regenerate. Loss or adverse modification of native grassland habitats would result in moderate residual impacts because they are uncommon throughout the B2H Project area and, therefore, habitat for grassland species is limited. Although disturbance to RCAs is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible (Design Features 15 and 16), the B2H Project in Segment 3 would have moderate residual impacts on this valuable wildlife habitat type.

Special Status Species

Alternative Routes and Route Variations

The amount of each wildlife habitat that would be disturbed in Segment 3 is compared by alternative in Table 3-127 in Section 3.2.3. Special status species using wildlife habitats in Segment 3 are described at the beginning of Section 3.2.4.5. Potential effects on special status wildlife species would be similar to potential effects on other wildlife species that use the same habitat types. The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on special status wildlife include installing devices to deter raptor perching on transmission line structures and minimize an increase in predation,

minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, conducting preconstruction surveys, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

The types of potential effects on special status wildlife species would be similar for all alternatives. Because mortality of special status species (without population-level effects) and temporary disturbance during critical or sensitive periods could occur (without population-level effects), the Proposed Action and all alternatives in Segment 3 could result in long-term moderate impacts on special status species. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Greater Sage-Grouse

Table 3-176 presents miles crossed and residual impacts on Greater Sage-Grouse PHMA and GHMA for all alternative routes and route variations in Segment 3. Levels of residual impacts and duration of impacts on Greater Sage-Grouse are described by alternative route and route variation below, and displayed in MV-9. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139).

Table 3-176. Greater Sage-Grouse Inventory Data and Residual Impacts for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]	
		Priority Habitat Management Areas	General Habitat Management Areas	High	Moderate
Applicant's Proposed Action	55.2	30.2	17.1	30.2	17.1
Variation S3-A1	*12.4*	*8.1*	*4.3*	*8.1*	*4.3*
Variation S3-A2	*12.2*	*9.0*	*3.2*	*9.0*	*3.2*
Variation S3-B1	*13.9*	*13.6*	*0.3*	*13.6*	*0.3*
Variation S3-B2	*14.4*	*4.2*	*3.6*	*4.2*	*3.6*
Variation S3-B3	*14.7*	*4.2*	*1.9*	*4.2*	*1.9*
Variation S3-B4	*14.3*	*2.3*	*1.2*	*2.3*	*1.2*
Variation S3-B5	*14.0*	*2.3*	*4.3*	*2.3*	*4.3*
Variation S3-C1	*21.1*	*8.5*	*5.3*	*8.5*	*5.3*
Variation S3-C2	*21.7*	*8.7*	*5.7*	*8.7*	*5.7*
Variation S3-C3	*21.0*	*0.0*	*1.1*	*0.0*	*1.1*
Variation S3-C4	*21.4*	*0.0*	*1.1*	*0.0*	*1.1*
Variation S3-C5	*21.0*	*0.0*	*1.1*	*0.0*	*1.1*
Variation S3-C6	*24.7*	*0.0*	*9.4*	*0.0*	*9.4*
Flagstaff A	55.3	18.9	21.1	18.9	21.1
Timber Canyon	70.3	0.0	28.8	0.0	28.8
Flagstaff A – Burnt River Mountain	55.3	10.4	16.9	10.4	16.9

Table 3-176. Greater Sage-Grouse Inventory Data and Residual Impacts for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]	
		Priority Habitat Management Areas	General Habitat Management Areas	High	Moderate
Flagstaff B	56.0	20.8	18.7	20.8	18.7
Flagstaff B – Burnt River West	55.7	13.2	13.4	13.2	13.4
Flagstaff B – Durkee	59.6	12.3	22.8	12.3	22.8

Table Notes
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]Low levels of impacts on Greater Sage-Grouse are not anticipated as a result of B2H Project implementation.

Table 3-177 displays acreage of disturbance to Greater Sage-Grouse habitat types for each of the alternative routes and route variations.

Table 3-177. Anticipated Acres of Disturbance for Greater Sage-Grouse for Segment 3—Baker Valley

Alternative Route	Total Acres of Disturbance	Priority Habitat Management Areas	General Habitat Management Areas
Applicant's Proposed Action	1,238	680	385
Variation S3-A1	*259*	*171*	*91*
Variation S3-A2	*252*	*186*	*66*
Variation S3-B1	*311*	*305*	*7*
Variation S3-B2	*315*	*92*	*79*
Variation S3-B3	*312*	*88*	*40*
Variation S3-B4	*300*	*49*	*25*
Variation S3-B5	*301*	*50*	*93*
Variation S3-C1	*502*	*202*	*126*
Variation S3-C2	*512*	*205*	*135*
Variation S3-C3	*515*	*0*	*27*
Variation S3-C4	*524*	*0*	*27*
Variation S3-C5	*576*	*0*	*30*
Variation S3-C6	*685*	*0*	*261*
Flagstaff A	1,228	422	471
Timber Canyon	1,691	0	694
Flagstaff A – Burnt River Mountain	1,241	232	376
Flagstaff B	1,239	461	414
Flagstaff B – Burnt River West	1,305	309	314
Flagstaff B – Durkee	1,422	293	544

Table Notes: Greater Sage-Grouse habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have long-term high and moderate residual impacts on Greater Sage-Grouse. Permanent high residual impacts would occur where PHMA is crossed as permanent

loss of PHMA and other impacts could result in population-level effects because PHMA represents areas identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Potential direct effects on Greater Sage-Grouse could include mortality due to electrocution; in-flight collisions with transmission line infrastructure; collisions with construction and maintenance vehicles; fragmentation of habitats due to the introduction of tall structures, increased EMFs, and construction of new roads; loss and degradation of habitat quality and function; disturbance to breeding activities due to increased human presence and noise at lek locations; disturbance during sensitive periods resulting from human presence, vehicle use, and noise during construction and maintenance; and interruption and/or alteration of seasonal migrations and movements among populations. Along with the direct effects that would be expected within the footprint of the Applicant's Proposed Action Alternative, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 41.3 percent is Greater Sage-Grouse PHMA on the Baker Oregon PAC and 25.2 percent is GHMA. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Indirect effects in these areas could include alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds; avoidance of habitat due to potential increase in raptor predation pressure; disruption of nesting and breeding activities and avoidance of habitat due to vehicle noise and human presence resulting from public use of new access roads; increased mammalian predation risk; increased raptor and raven predation risk; and alteration of behavioral patterns due to increased predation pressure. The types of potential direct and indirect effects on Greater Sage-Grouse are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Greater Sage-Grouse are listed in Table 3-140 and include installing devices to deter raptor perching on transmission line structures, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), conducting preconstruction surveys, implementing seasonal restrictions for sensitive periods and habitats, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4). Seasonal restrictions for Greater Sage-Grouse would be similar to the seasonal restrictions identified in the Oregon ARMPAs (refer to Appendix B). Moreover, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

Variations S3-A1 and S3-A2

The variations would have long-term high and moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action

Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 30.1 percent and 30.6 percent is Greater Sage-Grouse GHMA, for Variations S3-A1 and S3-A2, respectively, and 43.5 percent and 46.3 percent is PHMA on the Baker Oregon PAC, for Variations S3-A1 and S3-A2, respectively. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S3-B1, S3-B2, S3-B3, S3-B4, and S3-B5

The variations would have long-term high and moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176).

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 6.4 percent, 6.5 percent, 6.4 percent, 6.5 percent, and 6.6 would be Greater Sage-Grouse GHMA and 62.7 percent, 42.6 percent, 41.7 percent, 40.2 percent, and 41.3 would be PHMA on the Baker Oregon PAC for Variations S3-B1 and S3-B2, Variation S3-B3, Variation S3-B4, Variation S3-B5, respectively. Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S3-C1 and S3-C2

The variations would have long-term high and moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 32.5 percent and 32.0 percent would be Greater Sage-Grouse GHMA, and 27.6 percent and 26.2 percent would be PHMA on the Baker Oregon PAC, for Variations S3-C1 and S3-C2, respectively. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Potential

direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S3-C3, S3-C4, S3-C5, and S3-C6

The variations would have moderate residual impacts on Greater Sage-Grouse. Long-term moderate residual impacts would result from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 23.5 percent, 23.2 percent, 22.4 percent, and 26.8 percent would be Greater Sage-Grouse GHMA, and 14.4 percent, 14.1 percent, 14.0 percent, and 14.2 percent would be PHMA on the Baker Oregon PAC, for Variations S3-C3, S3-C4, S3-C4 and S3-C5, respectively. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff A Alternative

The Flagstaff A Alternative would have long-term high and moderate residual impacts on Greater Sage-Grouse. Permanent high residual impacts would be caused by permanent loss of PHMA that results in population-level effects because PHMA represents areas identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Long-term moderate residual impacts would result from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 25.2 percent would be Greater Sage-Grouse GHMA and 34.8 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer

(Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The Timber Canyon Alternative would have moderate residual impacts on Greater Sage-Grouse. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 33.6 percent would be Greater Sage-Grouse GHMA and 19.7 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain

The Flagstaff A – Burnt River Mountain Alternative would have long-term high and moderate residual impacts on Greater Sage-Grouse. Permanent high residual impacts would occur where PHMA is crossed as permanent loss of PHMA and other impacts could result in population-level effects because PHMA represents areas identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 21.3 percent would be Greater Sage-Grouse GHMA and 29.1 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer

(Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative would have long-term high and moderate residual impacts on Greater Sage-Grouse. Permanent high residual impacts would occur where PHMA is crossed as permanent loss of PHMA and other impacts could result in population-level effects because PHMA represents areas identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 25.0 percent would be Greater Sage-Grouse GHMA and 35.0 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative would have long-term high and moderate residual impacts on Greater Sage-Grouse. Permanent high residual impacts would occur where PHMA is crossed as permanent loss of PHMA and other impacts could result in population-level effects because PHMA represents areas identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of

which 20.7 percent would be Greater Sage-Grouse GHMA and 29.9 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee Alternative

The Flagstaff B – Durkee Alternative would have long-term high and moderate residual impacts on Greater Sage-Grouse. Permanent high residual impacts would occur where PHMA is crossed as permanent loss of PHMA and other impacts could result in population-level effects because PHMA represents areas identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-177.

Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 22.7 percent would be Greater Sage-Grouse GHMA and 28.4 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-176). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Migratory Birds Including Raptors

Applicant's Proposed Action Alternative

Direct impacts on raptors and other migratory birds during construction could include collision with B2H Project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. Raptors and other migratory birds are particularly sensitive to disturbance during the nesting period and some construction activities could cause nest failure or abandonment. The risk of collision risk already exists from existing transmission lines located along portions of the Applicant's Proposed Action; however, the risk of collision may be greater due to the increased size of the proposed transmission line towers. The types of potential effects on raptors and other migratory birds are described in detail at the beginning of Section 3.2.4.6.

Residual impact levels for raptors and other migratory birds have been determined in accordance with the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4. Because removal or disturbance to nesting sites for raptors and other migratory birds could occur, the Applicant's Proposed Action would result in long-term moderate residual impacts on raptors and other migratory birds. Short-term low residual impacts on bald and golden eagles would result from disruption of breeding and foraging behavior, and short-term moderate impacts on bald and golden eagles would result from disturbance to nesting sites. Short-term moderate residual impacts on bald and golden eagles would result from disruption of breeding and foraging behavior. Short-term moderate impacts from disturbance of nesting sites could occur if nests are located along the Applicant's Proposed Action during preconstruction surveys; no nests are currently known to occur within 0.5-mile of the Applicant's Proposed Action Alternative.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on raptors and other migratory birds include installing flight diverters, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, and conducting preconstruction surveys. The design features of the B2H Project for environmental protection and selective mitigation measures are described in detail in Table 2-7 and Table 2-13. In addition, adherence to the Applicant's Avian Protection Plan would minimize or avoid impacts from the B2H Project on raptors and other migratory birds.

Variations S3-A1 and S3-A2

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S3-B1

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative; however, the route does not parallel existing transmission lines, so no existing transmission line-collision risk exists. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S3-B2

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize

impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S3-B3, S3-B4, and S3-B5

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S3-C1, S3-C2, S3-C3, and S3-C4

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S3-C5

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative; however, the route does not parallel existing transmission lines, so no existing transmission line-collision risk exists. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S3-C6

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative; however, no bald and golden eagle nests are known occur within 0.5 mile, so short-term moderate impacts on eagles from disturbance to nesting sites would only be expected if nests are located along the route during preconstruction surveys. Also, no existing transmission line-collision risk exists, as the route does not parallel existing transmission lines. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff A Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative; however, no bald and golden eagle nests are known occur within 0.5 mile, so short-term moderate impacts on eagles from disturbance to nesting sites would only be expected if nests are located along the route during preconstruction surveys. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Big Game

The direct and indirect effects of the B2H Project on big game species could incrementally contribute to other factors preventing mule deer, elk, and bighorn sheep populations from meeting ODFW's management objectives for these species. However, as described below, design features of the B2H

Project for environmental protection and selective mitigation measures will minimize impacts on WMUs and big game habitat.

Table 3-178 presents miles crossed and residual impacts on big game habitats for all alternative routes and route variations in Segment 3. Levels of residual impacts and duration of impacts on big game are described by alternative route and route variation below, and displayed in MV-10. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-178. Big Game Inventory Data and Residual Impacts for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]			Residual Impacts[2]
		Bighorn Sheep Oregon Occupied Range	Mule Deer Winter Range	Elk Winter Range	Low
Applicant's Proposed Action	55.2	0.0	26.0	1.7	26.0
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.7*	*0.0*	*0.7*
Variation S3-B2	*14.4*	*0.0*	*4.3*	*0.0*	*4.3*
Variation S3-B3	*14.7*	*0.0*	*4.6*	*0.0*	*4.6*
Variation S3-B4	*14.3*	*0.0*	*4.6*	*0.0*	*4.6*
Variation S3-B5	*14.0*	*0.0*	*4.3*	*0.0*	*4.3*
Variation S3-C1	*21.1*	*0.0*	*17.5*	*1.7*	*17.5*
Variation S3-C2	*21.7*	*0.0*	*18.7*	*1.7*	*18.7*
Variation S3-C3	*21.0*	*0.0*	*21.1*	*4.9*	*21.1*
Variation S3-C4	*21.4*	*0.0*	*21.4*	*4.9*	*21.4*
Variation S3-C5	*21.0*	*0.8*	*21.0*	*10.0*	*21.0*
Variation S3-C6	*24.7*	*1.3*	*24.7*	*17.1*	*24.7*
Flagstaff A	55.3	0.0	29.6	1.7	29.6
Timber Canyon	70.3	0.0	37.1	43.1	59.0
Flagstaff A – Burnt River Mountain	55.3	0.0	33.2	4.9	33.2
Flagstaff B	56.0	0.0	29.9	1.7	29.9
Flagstaff B – Burnt River West	55.7	0.8	33.4	10.0	33.4
Flagstaff B – Durkee	59.6	1.3	37.1	17.1	37.1

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High or moderate levels of impacts on big game are not anticipated as a result of B2H Project implementation.

Table 3-179 displays acreage of disturbance on big game habitat for all alternatives and route variations in Segment 3.

Table 3-179. Anticipated Acres of Disturbance for Big Game for Segment 3—Baker Valley (acres)				
Alternative Route	**Total Disturbance**	**Bighorn Sheep Oregon Occupied Range**	**Mule Deer Winter Range**	**Elk Winter Range**
Applicant's Proposed Action	1,238	0	585	38
Variation S3-A1	*259*	*0*	*0*	*0*
Variation S3-A2	*252*	*0*	*0*	*0*
Variation S3-B1	*311*	*0*	*16*	*0*
Variation S3-B2	*315*	*0*	*94*	*0*
Variation S3-B3	*312*	*0*	*97*	*0*
Variation S3-B4	*300*	*0*	*97*	*0*
Variation S3-B5	*301*	*0*	*93*	*0*
Variation S3-C1	*502*	*0*	*417*	*40*
Variation S3-C2	*512*	*0*	*441*	*40*
Variation S3-C3	*515*	*0*	*517*	*120*
Variation S3-C4	*524*	*0*	*526*	*120*
Variation S3-C5	*576*	*22*	*576*	*274*
Variation S3-C6	*685*	*36*	*685*	*475*
Flagstaff A	1,228	0	661	38
Timber Canyon	1,691	0	893	1038
Flagstaff A – Burnt River Mountain	1,241	0	739	109
Flagstaff B	1,239	0	663	38
Flagstaff B – Burnt River West	1,305	19	782	234
Flagstaff B – Durkee	1,422	31	885	408
Table Note: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.				

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have short- and long-term low residual impacts on mule deer and elk. Anticipated acres of disturbance to big game are presented in Table 3-179. The Applicant's Proposed Action does not cross bighorn sheep designated habitat; therefore, impacts on bighorn sheep would not be anticipated. Short- and long-term residual impacts from the Applicant's Proposed Action would be low because impacts would have only minor adverse effects on big game and would not limit the long-term sustainability of populations.

Direct effects on big game could include vehicle collisions, noise and visual disturbance, and habitat loss and modification. Indirect effects could include increased disturbance to big game from increased human activity from use of new or improved access roads.

The types of potential effects on big game are described in detail at the beginning of Section 3.2.4.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on big game are listed in Table 3-140 and include implementing seasonal restrictions, limiting new or improved access to areas previously inaccessible,

leaving vegetation in place whenever possible, and reclaiming construction areas with an agency or landowner-approved seed mix (refer to Section 3.2.4.4).

Variations S3-A1 and S3-A2

The variations do not cross designated big game habitat; therefore, impacts on big game would not be anticipated.

Variations S3-B1 and S3-B2, S3-B3, S3-B4, and S3-B5

The variations would have short- and long-term low residual impacts on mule deer. The variations do not cross elk winter range or bighorn sheep designated habitat; therefore, impacts on elk and bighorn sheep would not be anticipated. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S3-C1, S3-C2, S3-C3, and S3-C4

The variations would have short- and long-term low residual impacts on mule deer and elk. The variations do not cross bighorn sheep designated habitat; therefore, impacts on bighorn sheep would not be anticipated. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S3-C5 and S3-C6

The variations would have short- and long-term low residual impacts on mule deer, elk, and bighorn sheep. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff A Alternative

The Flagstaff A Alternative would have short- and long-term low residual impacts on mule deer and elk. The Flagstaff A Alternative does not cross bighorn sheep designated habitat; therefore, impacts on bighorn sheep would not be anticipated. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

Timber Canyon Alternative would have short- and long-term low residual impacts on mule deer and elk. The Timber Canyon Alternative does not cross bighorn sheep designated habitat; therefore, impacts on bighorn sheep would not be anticipated. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would

minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative would have short- and long-term low residual impacts on mule deer and elk. The Flagstaff A – Burnt River Mountain Alternative does not cross bighorn sheep designated habitat; therefore, impacts on bighorn sheep would not be anticipated. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative would have short- and long-term low residual impacts on mule deer and elk. The Flagstaff B Alternative does not cross bighorn sheep designated habitat; therefore, impacts on bighorn sheep would not be anticipated. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative would have short- and long-term low residual impacts on mule deer, elk, and bighorn sheep. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee Alternative

The Flagstaff B – Durkee Alternative would have short- and long-term low residual impacts on mule deer, elk, and bighorn sheep. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Management Indicator Species and USFS Sensitive Species

Alternative Routes and Route Variations

The Timber Canyon Alternative is the only alternative route that crosses national forest land in Segment 3 and would, therefore, be the only route to potentially impact USFS MIS. The environmental consequences for MIS and USFS sensitive species are described in Appendix F.

Conclusion

All alternative routes and route variations would result in short-term, long-term, and permanent effects on wildlife habitat and wildlife species. A summary of effects on Greater Sage-Grouse, migratory birds including raptors, and big game are provided below.

Greater Sage-Grouse

All alternative routes cross Greater Sage-Grouse GHMA and PHMA in the Baker PAC, with the exception of the Timber Canyon Alternative, which only crosses GHMA. Residual impacts on Greater Sage-Grouse are anticipated to be high where PHMA is crossed and moderate where GHMA is crossed, from adverse effects such as loss of habitat, increased avian predation, and habitat avoidance. In addition to seasonal restrictions implemented during sensitive periods and other avoidance and minimization measures to reduce impacts on Greater Sage-Grouse, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

The Applicant's Proposed Action Alternative with Variations S3-A2, S3-B1, and S3-C2 would have the greatest impact on Greater Sage-Grouse from crossing more PHMA than the other alternative routes. In addition, Variation S3-B1 of the Applicant's Proposed Action Alternative crosses higher quality habitat as it is located closer to the center of the Baker PAC and is further from other anthropogenic disturbances. Compared to the other alternative routes that cross PHMA, the Flagstaff A – Burnt River Mountain Alternative would have the lowest impact on Greater Sage-Grouse as it crosses the least amount of PHMA. The Flagstaff A – Burnt River Mountain, Flagstaff B – Burnt River West, and the Flagstaff B – Durkee alternatives all avoid PHMA to a greater extent that the Applicant's Proposed Action Alternative, and where they do cross PHMA, they are located on the periphery of PHMA and are colocated with existing anthropogenic disturbances. The Timber Canyon Alternative would have the lowest impact on Greater Sage-Grouse, as it completely avoids PHMA.

Migratory Birds Including Raptors

All alternative routes and route variations would result in moderate residual impacts on raptors and other migratory birds from removal or disturbance to nesting sites, and from the disruption of bald and golden eagle breeding and foraging behavior. Avoidance and minimization measures, including limiting B2H Project activities and implementing spatial restrictions during the nesting season, would reduce impacts on migratory birds during construction and operation of the B2H Project. Removal of and disturbance to nesting habitat would not negatively affect raptors and other migratory birds appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Habitat disturbed during construction would be reclaimed and would restore migratory bird habitats similar to those disturbed. While the resulting habitats may cause a shift in avian species use, population-level effects on migratory birds are not anticipated to occur.

Compared to other alternative routes, the Timber Canyon Alternative would have the lowest impact on bald and golden eagles as no bald or golden eagle nests are known within 0.5 mile of the route, but the

Timber Canyon Alternative would affect the greatest amount of migratory bird habitat overall due to its longer length.

Big Game

All alternative routes would have low residual impacts on big game. In addition to other direct and indirect effects, short- and long-term habitat loss would occur, but would not negatively affect big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Disturbance to big game during sensitive periods would be minimized through the implementation of seasonal restrictions. The Timber Canyon Alternative would have the greatest impact on big game from crossing more big game habitat than other alternative routes.

Summary

None of the alternative routes considered in Segment 3 would clearly result in the least overall impacts on wildlife resources. The Timber Canyon Alternative would result in the least impacts on Greater Sage-Grouse as no PHMA would be crossed, but would result in the greatest impacts on migratory birds and big game from crossing more habitat than the other alternative routes. However, impacts on migratory bird and big game habitat would not negatively affect these species appreciably due to the small amount of habitat affected compared to their large home ranges. Compared to the other alternative routes that cross Greater Sage-Grouse PHMA, the Flagstaff A – Burnt River Mountain Alternative would have the least impact on Greater Sage-Grouse as it crosses the least amount of PHMA.

SEGMENT 4—BROGAN

Wildlife Habitat

Alternative Routes and Route Variations

The majority of habitat that would be affected in Segment 4 is shrubland habitat. RCAs and grasslands also would be affected, but to a lesser extent. The amount of wildlife habitat types that would be disturbed by each alternative route and route variation in Segment 4 is presented in Table 3-131, and residual impacts on each wildlife habitat type is provided in Table 3-130 in Section 3.2.3.

The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6. The primary impact on wildlife habitats would include habitat removal and fragmentation. The Proposed Action and all alternatives and variations in Segment 4 would result in moderate residual impacts on shrubland and forest/woodland habitat types because they support a wide range of species and are slow to regenerate. Loss or adverse modification of native grassland habitats would result in moderate residual impacts because they are uncommon throughout the B2H Project area and, therefore, habitat for grassland species is limited. Although disturbance to RCAs is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible (Design Features 15 and 16), the B2H Project in Segment 4 would have moderate residual impacts on this valuable wildlife habitat type.

Special Status Species

Alternative Routes and Route Variations

The amount of each wildlife habitat that would be disturbed in Segment 4 is compared by alternative in Table 3-131 in Section 3.2.3. Special status species using wildlife habitats in Segment 4 are described at the beginning of Section 3.2.4.5. Potential effects on special status wildlife species would be similar to potential effects on other wildlife species that use the same habitat types. The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on special status wildlife include installing devices to deter raptor perching on transmission line structures and minimize an increase in predation, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, conducting preconstruction surveys, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

The types of potential effects on special status wildlife species would be similar for all alternatives. Because mortality of special status species (without population-level effects) and temporary disturbance during critical or sensitive periods could occur (without population-level effects), the Proposed Action and all alternatives in Segment 4 could result in long-term moderate impacts on special status species. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Greater Sage-Grouse

Table 3-180 presents miles crossed and residual impacts on Greater Sage-Grouse PHMA and GHMA for all alternative routes and route variations in Segment 4. Levels of residual impacts and duration of impacts on Greater Sage-Grouse are described by alternative route and route variation below, and displayed in MV-9. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139).

Table 3-180. Greater Sage-Grouse Inventory Data and Residual Impacts for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]	
		Priority Habitat Management Areas	General Habitat Management Areas	High	Moderate
Applicant's Proposed Action	40.1	20.3	18.7	20.3	18.7
Variation S4-A1	*5.9*	*0.0*	*4.8*	*0.0*	*4.8*
Variation S4-A2	*6.0*	*0.0*	*4.8*	*0.0*	*4.8*
Variation S4-A3	*6.1*	*0.0*	*4.8*	*0.0*	*4.8*

Table 3-180. Greater Sage-Grouse Inventory Data and Residual Impacts for Segment 4—Brogan (miles crossed)					
Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]	
		Priority Habitat Management Areas	General Habitat Management Areas	High	Moderate
Tub Mountain South	40.5	6.8	10.2	6.8	10.2
Willow Creek	34.6	15.5	14.5	15.5	14.5

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]Low levels of impacts on Greater Sage-Grouse are not anticipated as a result of B2H Project implementation.

Table 3-181 displays acreage of disturbance to Greater Sage-Grouse habitat types for each of the alternative routes and route variations.

Table 3-181. Anticipated Acres of Disturbance for Greater Sage-Grouse for Segment 4—Brogan			
Alternative Route	Total Acres of Disturbance	Priority Habitat Management Areas	General Habitat Management Areas
Applicant's Proposed Action	953	480	442
Variation S4-A1	*154*	*0*	*125*
Variation S4-A2	*149*	*0*	*121*
Variation S4-A3	*153*	*0*	*122*
Tub Mountain South	901	151	227
Willow Creek	777	348	326

Table Note: Greater Sage-Grouse habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have long-term high and moderate residual impacts on Greater Sage-Grouse. Permanent high residual impacts would occur where PHMA is crossed as permanent loss of PHMA and other impacts could result in population-level effects because PHMA represents areas identified as having the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. GHMA represents areas of occupied seasonal or year-round Greater Sage-Grouse habitat, but not areas with the highest habitat value for maintaining sustainable Greater Sage-Grouse populations. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-181.

Potential direct effects on Greater Sage-Grouse could include mortality due to electrocution; in-flight collisions with transmission line infrastructure; collisions with construction and maintenance vehicles; fragmentation of habitats due to the introduction of tall structures, increased EMFs, and construction of new roads; loss and degradation of habitat quality and function; disturbance to breeding activities due to increased human presence and noise at lek locations; disturbance during sensitive periods resulting from human presence, vehicle use, and noise during construction and maintenance; and interruption and/or alteration of seasonal migrations and movements among populations.

Along with the direct effects that would be expected within the footprint of the Applicant's Proposed Action Alternative, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 47.8 percent would be Greater Sage-Grouse PHMA in the Cow Valley Oregon PAC and 38.4 percent would be GHMA. Impacts also would be expected on leks present in the 3.1-mile buffer (Table 3-180). Indirect effects on Greater Sage-Grouse could include alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds; avoidance of habitat due to potential increase in raptor predation pressure; disruption of nesting and breeding activities and avoidance of habitat due to vehicle noise and human presence resulting from public use of new access roads; increased mammalian predation risk; increased raptor and raven predation risk; and alteration of behavioral patterns due to increased predation pressure. The types of potential direct and indirect effects on Greater Sage-Grouse are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Greater Sage-Grouse are listed in Table 3-140 and include installing devices to deter raptor perching on transmission line structures, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), conducting preconstruction surveys, implementing seasonal restrictions for sensitive periods and habitats, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4) Seasonal restrictions for Greater Sage-Grouse would be similar to the seasonal restrictions identified in the Oregon ARMPAs (refer to Appendix B). Moreover, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

Variations S4-A1, S4-A2, and S4-A3

The variations do not cross and would not be expected to have direct impacts on Greater Sage-Grouse PHMA; however, PHMA in the Cow Valley Oregon PAC is within 3.1 miles of the variations and indirect impacts would be anticipated. The variations do cross and would be expected to have direct and indirect impacts on Greater Sage-Grouse GHMA.

The variations would have long-term moderate residual impacts on Greater Sage-Grouse. The duration of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-181.

Along with the direct effects that would be expected within the footprint of the variations, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 38.0 percent, 38.6 percent, and 38.1 percent would be Greater Sage-Grouse GHMA and 26.8 percent, 25.5 percent, and 25.6 percent would be PHMA in the Cow Valley Oregon PAC for Variations S4-A1, S4-A2, and S4-A3 respectively. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-180). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The Tub Mountain South Alternative would have long-term high and moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. However, compared to the Applicant's Proposed Action Alternative and the Willow Creek Alternative, the Tub Mountain South Alternative largely avoids PHMA. Where PHMA is crossed by the Tub Mountain South Alternative, the route follows the outer edge of PHMA, which is closer to anthropogenic disturbances and, thus, likely represent lower quality habitat. The Tub Mountain South Alternative route also crosses less GHMA, and crosses within 3.1 miles of fewer leks than the other two alternative routes.

Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-181. Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 27.4 percent would be Greater Sage-Grouse GHMA and 13.6 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-180). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Willow Creek Alternative

The Willow Creek Alternative would have long-term high and moderate residual impacts on Greater Sage-Grouse. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. However, compared to the Applicant's Proposed Action Alternative, the Willow Creek Alternative crosses less PHMA and GHMA and crosses within 3.1 miles of a few number of leks. Where PHMA is crossed by the Willow Creek Alternative, the route follows closer to the outer edge of PHMA, which is closer to anthropogenic disturbances and, thus, likely represent lower quality habitat.

Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-181. Along with the direct effects that would be expected within the footprint of the variation, indirect effects on Greater Sage-Grouse would be anticipated within a 3.1-mile buffer around the route centerline, of which 39.7 percent would be Greater Sage-Grouse GHMA and 35.0 percent would be PHMA on the Baker Oregon PAC. Impacts also would be expected on leks present within the 3.1-mile buffer (Table 3-180). Potential direct and indirect effects on Greater Sage-Grouse would be similar to that described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Migratory Birds Including Raptors

Applicant's Proposed Action Alternative

Direct impacts on raptors and other migratory birds during construction could include collision with project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. Raptors and other migratory birds are particularly sensitive to disturbance during the nesting period and some construction activities could cause nest failure or abandonment. The risk of collision risk already exists from existing transmission lines located along portions of the Applicant's Proposed Action; however, the risk of collision may be greater due to the increased size of the proposed transmission line towers. The types of potential effects on raptors and other migratory birds are described in detail at the beginning of Section 3.2.4.6.

Residual impact levels for raptors and other migratory birds have been determined in accordance with the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4. Because removal or disturbance to nesting sites for raptors and other migratory birds could occur, the Applicant's Proposed Action would result in long-term moderate residual impacts on raptors and other migratory birds. Short-term moderate residual impacts on bald and golden eagles would result from disruption of breeding and foraging behavior, and short-term moderate impacts on bald and golden eagles would result from disturbance to nesting sites.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on raptors and other migratory birds include installing flight diverters, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, and conducting preconstruction surveys (refer to Section 3.2.4.4). In addition, adherence to the Applicant's Avian Protection Plan would minimize or avoid impacts from the B2H Project on raptors and other migratory birds.

Variations S4-A1, S4-A2, and S4-A3

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize

impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Willow Creek Alternative

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Big Game

The direct and indirect effects of the B2H Project on big game species could incrementally contribute to other factors preventing mule deer, elk, and pronghorn populations from meeting ODFW's management objectives for these species. However, as described below, design features of the B2H Project for environmental protection and selective mitigation measures will minimize impacts on WMUs and big game habitat.

Table 3-182 presents miles crossed and residual impacts on big game habitats for all alternative routes and route variations in Segment 4. Levels of residual impacts and duration of impacts on big game are described by alternative route and route variation below, and displayed in MV-10. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-182. Alternative Route Comparison for Big Game Inventory Data and Residual Impacts for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]			Residual Impacts[2]
		Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range	Low
Applicant's Proposed Action	40.1	0.0	26.0	35.4	40.1
Variation S4-A1	*5.9*	*0.0*	*5.9*	*5.9*	*5.9*
Variation S4-A2	*6.0*	*0.0*	*6.0*	*6.0*	*6.0*
Variation S4-A3	*6.1*	*0.0*	*6.1*	*6.1*	*6.1*
Tub Mountain South	40.5	13.1	37.0	24.1	38.3
Willow Creek	34.6	2.9	29.5	25.5	32.3

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High or moderate levels of impacts on Big Game are not anticipated as a result of B2H Project implementation.

Table 3-183 displays acreage of disturbance in big game habitat for all alternatives and route variations in Segment 4.

Table 3-183. Anticipated Acres of Disturbance for Big Game for Segment 4—Brogan Valley (acres)

Alternative Route	Total Disturbance	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range
Applicant's Proposed Action	953	0	615	837
Variation S4-A1	*154*	*0*	*154*	*154*
Variation S4-A2	*149*	*0*	*152*	*152*
Variation S4-A3	*153*	*0*	*155*	*155*
Tub Mountain South	901	292	824	536
Willow Creek	777	65	663	573

Table Note: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have short- and long-term low residual impacts on mule deer and elk. Anticipated acres of disturbance to big game are presented in Table 3-183. Short- and long-term residual impacts from the Applicant's Proposed Action would be low because impacts would have only minor adverse effects on big game and would not limit the long-term sustainability of populations. The Applicant's Proposed Action does not cross pronghorn winter range; therefore, impacts on pronghorn winter range would not be anticipated.

Direct effects on big game could include vehicle collisions, noise and visual disturbance, and habitat loss and modification. Indirect effects could include increased disturbance to big game from increased human activity from use of new or improved access roads. The types of potential effects on big game are described in detail at the beginning of Section 3.2.4.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on big game are listed in Table 3-140 and include implementing seasonal restrictions, limiting new or improved access to areas previously inaccessible, leaving vegetation in place whenever possible, and reclaiming construction areas with an agency or landowner-approved seed mix (refer to Section 3.2.4.4).

Variations S4-A1, S4-A2, and S4-A3

The variations would have short- and long-term low residual impacts on mule deer and elk. The variations do not cross pronghorn winter range; therefore, impacts on pronghorn winter range are not anticipated. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The Tub Mountain Alternative would have short- and long-term low residual impacts on mule deer, elk, and pronghorn. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Willow Creek Alternative

The Willow Creek Alternative would have short- and long-term low residual impacts on mule deer, elk, and pronghorn. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Conclusion

All alternative routes and route variations would result in short-term, long-term, and permanent effects on wildlife habitat and wildlife species. A summary of effects on Greater Sage-Grouse, migratory birds including raptors, and big game are provided below.

Greater Sage-Grouse

All alternative routes cross Greater Sage-Grouse GHMA and PHMA in the Cow Valley PAC. Residual impacts on Greater Sage-Grouse are anticipated to be high where PHMA is crossed and moderate where GHMA is crossed, from adverse effects such as loss of habitat, increased avian predation, and habitat avoidance. In addition to seasonal restrictions implemented during sensitive periods and other avoidance and minimization measures to reduce impacts on Greater Sage-Grouse, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

The Tub Mountain South Alternative would have the lowest impact on Greater Sage-Grouse, as it largely avoids PHMA. Where PHMA is crossed by the Tub Mountain South Alternative, the route follows the outer edge of PHMA, which is closer to anthropogenic disturbances and, thus, represent lower quality habitat. The Tub Mountain South Alternative route also crosses less GHMA, and crosses within 3.1 miles of a few number of leks than the other two alternative routes.

The Applicant's Proposed Action Alternative would have the greatest impact on Greater Sage-Grouse from crossing more PHMA and GHMA than the other two alternative routes. In addition, the Applicant's Proposed Action Alternative crosses higher quality habitat as it is located closer to the center of the Cow Valley PAC and a greater number of leks, and is further from anthropogenic disturbances.

Migratory Birds Including Raptors

All alternative routes and route variations would result in moderate residual impacts on raptors and other migratory birds from removal or disturbance to nesting sites, and from the disruption of bald and golden eagle breeding and foraging behavior. Avoidance and minimization measures, including limiting

B2H Project activities and implementing spatial restrictions during the nesting season, would reduce impacts on migratory birds during construction and operation of the B2H Project. Removal of and disturbance to nesting habitat would not negatively affect raptors and other migratory birds appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Habitat disturbed during construction would be reclaimed and would restore migratory bird habitats similar to those disturbed. While the resulting habitats may cause a shift in avian species use, population-level effects on migratory birds are not anticipated to occur.

The Applicant's Proposed Action Alternative would have the highest impact on bald and golden eagles from crossing within 0.5 and 5 miles of a greater number of bald and golden eagle nests than the other alternative routes, but would affect less migratory bird habitat overall compared to the Willow Creek Alternative due to its shorter length.

Big Game

All alternative routes would have low residual impacts on big game. In addition to other direct and indirect effects, short- and long-term habitat loss would occur, but would not negatively affect big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Disturbance to big game during sensitive periods would be minimized through the implementation of seasonal restrictions. The Willow Creek Alternative would have the lowest impact on big game from crossing less big game habitat than the other alternative routes.

Summary

The Tub Mountain South Alternative would result in the least overall impacts on wildlife resources compared to the other alternative routes in Segment 4 primarily because it would result in the least impacts on Greater Sage-Grouse, as it largely avoids PHMA. The Tub Mountain South Alternative also would result in the least impacts on bald and golden eagles. The Tub Mountain South Alternative would result in greater impacts on migratory bird and big game habitat from crossing more habitat as compared to the Willow Creek Alternative, but impacts would not negatively affect these species appreciably due to the small amount of habitat affected compared to their large home ranges.

SEGMENT 5—MALHEUR

Wildlife Habitat

Alternative Routes and Route Variations

The majority of habitat that would be affected in Segment 5 is shrubland habitat. RCAs and grasslands also would be affected, but to a lesser extent. In particular, the B2H Project would affect these three habitat types on the Owyhee River Below the Dam ACEC. The amount of wildlife habitat types that would be disturbed by each alternative route and route variation in Segment 5 is presented in Table 3-134 and residual impacts on each wildlife habitat type is provided in Table 3-135 in Section 3.2.3.

The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6. The primary impact on wildlife habitats would include habitat removal and fragmentation. The Applicant's Proposed Action Alternative and all alternatives and variations in

Segment 5 would result in moderate residual impacts on shrubland and forest/woodland habitat types because they support a wide range of species and are slow to regenerate. Loss or adverse modification of native grassland habitats would result in moderate residual impacts because they are uncommon throughout the B2H Project area and, therefore, habitat for grassland species is limited. Although disturbance to RCAs is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible (Design Features 15 and 16), the B2H Project in Segment 5 would have moderate residual impacts on this valuable wildlife habitat type.

Special Status Species

Alternative Routes and Route Variations

The amount of each wildlife habitat that would be disturbed in Segment 5 is compared by alternative in Table 3-134 in Section 3.2.3. Special status species using wildlife habitats in Segment 5 are described at the beginning of Section 3.2.4.5. Potential effects on special status wildlife species would be similar to potential effects on other wildlife species that use the same habitat types. The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on special status wildlife include installing devices to deter raptor perching on transmission line structures and minimize an increase in predation, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, conducting preconstruction surveys, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

The types of potential effects on special status wildlife species would be similar for all alternatives. Because mortality of special status species (without population-level effects) and temporary disturbance during critical or sensitive periods could occur (without population-level effects), the Applicant's Proposed Action Alternative and all alternatives and variations in Segment 5 could result in long-term moderate impacts on special status species. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Columbia Spotted Frog

Table 3-184 presents miles crossed and residual impacts on Columbia spotted frog habitat for all alternative routes and route variations in Segment 5. Levels of residual impacts and duration of impacts on Columbia spotted frog are described by alternative route and route variation below, and displayed in MV-8. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139).

Table 3-184. Columbia Spotted Frog Inventory Data and Residual Impacts for Segment 5—Malheur (miles crossed)					
Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]	
		Potentially Occupied Habitat (Higher Quality)	Suitable Habitat (High Potential)	Moderate	Low
Applicant's Proposed Action	40.4	0.0	1.8	0.0	1.8
Variation S5-A1	*7.4*	*0.0*	*0.5*	*0.0*	*0.5*
Variation S5-A2	*7.4*	*0.1*	*0.6*	*0.1*	*0.6*
Variation S5-B1	*2.5*	*0.0*	*0.7*	*0.0*	*0.7*
Variation S5-B2	*2.8*	*0.0*	*0.8*	*0.0*	*0.8*
Malheur S	43.5	0.9	2.0	0.9	2.0
Malheur A	43.1	0.9	2.0	0.9	2.0

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High levels of impacts on Columbia spotted frog are not anticipated as a result of B2H Project implementation.

Table 3-185 displays acreage of disturbance to Columbia spotted frog habitat types for each of the alternative routes and route variations.

Table 3-185. Anticipated Acres of Disturbance for Columbia Spotted Frog for Segment 5—Malheur			
Alternative Route	Total Acres of Disturbance	Potentially Occupied Habitat (Higher Quality)	Suitable Habitat (High Potential)
Applicant's Proposed Action	884	0	39
Variation S5-A1	*141*	*0*	*10*
Variation S5-A2	*147*	*2*	*12*
Variation S5-B1	*56*	*0*	*15*
Variation S5-B2	*57*	*0*	*16*
Malheur S	974	20	45
Malheur A	932	19	43

NOTES: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would have long-term moderate and low residual impacts on Columbia spotted frog. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-185. The only Columbia spotted frog habitat types that the Applicant's Proposed Action Alternative cross are suitable habitat (high potential) and potentially occupied habitat (higher quality); therefore, impacts on other habitat types would not be anticipated. Long-term residual impacts would be moderate for potentially occupied habitat (higher quality) because impacts could have adverse effects on Columbia spotted frog, but would not reduce population viability. Long-term residual impacts would be low for suitable habitat (high potential) because impacts could have minor adverse effects on Columbia spotted frog, but would not reduce population viability.

Potential direct effects on Columbia spotted frog could include mortality; modification, fragmentation, and loss of habitat; displacement; and noise-related disturbance. Potential indirect effects on Columbia spotted frog could include alteration of native vegetation through introduction and spread of invasive plants and noxious weeds, increased predation risk, and increased water turbidity from fugitive dust. The types of potential direct and indirect effects on Columbia spotted frog are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Columbia spotted frog are listed in Table 3-140 and include avoiding or minimizing impacts on RCAs, conducting preconstruction surveys, implementing seasonal and spatial restrictions for sensitive periods and habitats, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

Variation S5-A1

Variation S5-A1 would have long-term low residual impacts on Columbia spotted frog. The only Columbia spotted frog habitat type that Variation S5-A1 crosses is suitable habitat (high potential); therefore, impacts on other habitat types would not be anticipated. Long-term residual impacts would be low because impacts could have minor adverse effects on Columbia spotted frog, but would not reduce population viability. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-185.

Potential direct and indirect effects on Columbia spotted frog would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Columbia spotted frog would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S5-A2

Variation S5-A2 would have long-term moderate and low residual impacts on Columbia spotted frog. The only Columbia spotted frog habitat types that Variation S5-A2 crosses are suitable habitat (high potential) and potentially occupied habitat (higher quality); therefore, impacts on other habitat types are not anticipated. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-185.

Potential direct and indirect effects on Columbia spotted frog would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Columbia spotted frog would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S5-B1 and S5-B2

Variations S5-B1 and S5-B2 would have long-term low residual impacts on Columbia spotted frog. The only Columbia spotted frog habitat type that Variations S5-B1 and S5-B2 cross is suitable habitat (high potential); therefore, impacts on other habitat types would not be anticipated. Long-term residual impacts would be low because impacts could have minor adverse effects on Columbia spotted frog, but would not reduce population viability. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-185.

Potential direct and indirect effects on Columbia spotted frog would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Columbia spotted frog would be the same as those described for the Applicant's Proposed Action Alternative.

Malheur S and Malheur A Alternatives

The Malheur S and Malheur S Alternatives would have long-term moderate and low residual impacts on Columbia spotted frog. The only Columbia spotted frog habitat types that the Malheur S and Malheur S Alternatives cross are suitable habitat (high potential) and potentially occupied habitat (higher quality); therefore, impacts on other habitat types would not be anticipated. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-185.

Potential direct and indirect effects on Columbia spotted frog would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Columbia spotted frog would be the same as those described for the Applicant's Proposed Action Alternative.

Greater Sage-Grouse

Table 3-186 presents miles crossed and residual impacts on Greater Sage-Grouse habitat for all alternative routes and route variations in Segment 5. Levels of residual impacts and duration of impacts on Greater Sage-Grouse are described by alternative route and route variation below, and displayed in MV-9. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139).

Table 3-186. Alternative Route Comparison for Greater Sage-Grouse Inventory Data and Residual Impacts for Segment 5—Malheur (miles crossed)					
Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]	
		Priority Habitat Management Areas	General Habitat Management Areas	High	Moderate
Applicant's Proposed Action	40.4	0.0	11.2	0.0	11.2
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.2*	*0.0*	*0.2*
Variation S5-B2	*2.8*	*0.0*	*1.1*	*0.0*	*1.1*
Malheur S	43.5	0.0	22.4	0.0	22.4
Malheur A	43.1	0.0	25.6	0.0	25.6

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]Low levels of impacts on Greater Sage-Grouse are not anticipated as a result of B2H Project implementation.

Table 3-187 displays acreage of disturbance to Greater Sage-Grouse habitat types for each of the alternative routes and route variations.

Table 3-187. Anticipated Acres of Disturbance for Greater Sage-Grouse for Segment 5—Malheur			
Alternative Route	Total Acres of Disturbance	Priority Habitat Management Areas	General Habitat Management Areas
Applicant's Proposed Action	884	0	245
Variation S5-A1	*141*	*0*	*0*
Variation S5-A2	*147*	*0*	*0*
Variation S5-B1	*56*	*0*	*4*
Variation S5-B2	*57*	*0*	*22*
Malheur S	974	0	501
Malheur A	932	0	554

Table Note: Greater Sage-Grouse habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would not be expected to have impacts on Greater Sage-Grouse PHMA or leks, as neither occur within 3.1 miles. The Applicant's Proposed does cross and would be expected to have direct and indirect impacts on Greater Sage-Grouse GHMA.

The Applicant's Proposed Action would have long-term moderate residual impacts on Greater Sage-Grouse. Long-term moderate residual impacts would occur where GHMA is crossed because impacts would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-187.

Potential direct effects on Greater Sage-Grouse could include mortality due to electrocution; in-flight collisions with transmission line infrastructure; collisions with construction and maintenance vehicles; fragmentation of habitats due to the introduction of tall structures, increased EMFs, and construction of

new roads; loss and degradation of habitat quality and function; disturbance to breeding activities due to increased human presence and noise at lek locations; disturbance during sensitive periods resulting from human presence, vehicle use, and noise during construction and maintenance; and interruption and/or alteration of seasonal migrations and movements among populations. Along with the direct effects that would be expected within the footprint of the Applicant's Proposed Action Alternative, indirect effects on Greater Sage-Grouse would be anticipated in a 3.1-mile buffer around the route centerline, of which 25.9 percent is GHMA. Indirect effects on Greater Sage-Grouse could include alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds; avoidance of habitat due to potential increase in raptor predation pressure; disruption of nesting and breeding activities and avoidance of habitat due to vehicle noise and human presence resulting from public use of new access roads; increased mammalian predation risk; increased raptor and raven predation risk; and alteration of behavioral patterns due to increased predation pressure. The types of potential direct and indirect effects on Greater Sage-Grouse are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Greater Sage-Grouse are listed in Table 3-140 and include installing devices to deter raptor perching on transmission line structures, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), conducting preconstruction surveys, implementing seasonal restrictions for sensitive periods and habitats, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4). Seasonal restrictions for Greater Sage-Grouse would be similar to the seasonal restrictions identified in the Oregon ARMPAs (refer to Appendix B). Moreover, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

Variation S5-A1 and S5-A2

Greater Sage-Grouse GHMA occurs in the study corridors of Variations S5-A1 and S5-A2. However, only indirect effects would be expected, as the route variations do not cross GHMA. The route variations are not within 3.1 miles of other designated habitat types or leks; therefore, identifiable impacts would not be anticipated on other designated habitat types or leks.

Indirect effects on Greater Sage-Grouse would be anticipated in a 3.1-mile buffer around the variations' centerline, of which 5.7 percent is GHMA for Variation S5-A1 and 9.5 percent is GHMA for Variation S5-A2. Potential indirect effects on Greater Sage-Grouse would be similar to those described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S5-B1 and S5-B2

Greater Sage-Grouse GHMA occurs in the study corridors of Variations S5-B1 and Variations S5-B2. However, only indirect effects would be expected, as the route variations do not cross GHMA. The route variations are not within 3.1 miles of other designated habitat types or leks; therefore, identifiable impacts would not be anticipated on other designated habitat types or leks.

Variations S5-B1 and S5-B2 would have long-term moderate residual impacts on Greater Sage-Grouse. Long-term moderate residual impacts would result from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-187.

Along with the direct effects that would be expected within the footprint of the variations, indirect effects on Greater Sage-Grouse would be anticipated in a 3.1-mile buffer around the variations' centerline, of which 29.9 percent is GHMA for Variation S5-B1 and 29.0 percent is GHMA for Variation S5-B2. Potential direct and indirect effects on Greater Sage-Grouse would be similar to those described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Malheur S and Malheur A Alternatives

Neither PHMA nor leks occur in the study corridors of the Malheur S and Malheur A Alternatives; therefore, identifiable impacts would not be expected on PHMA or leks. The alternative routes do cross and would be expected to have direct and indirect impacts on Greater Sage-Grouse GHMA.

The Malheur S and Malheur A Alternatives would have long-term moderate residual impacts on Greater Sage-Grouse. Long-term moderate residual impacts would result from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-187.

Along with the direct effects that would be expected within the footprint of the route variations, indirect effects on Greater Sage-Grouse would be anticipated in a 3.1-mile buffer around the alternative routes' centerline, of which 55.6 percent is GHMA for the Malheur A Alternative, and 53.9 percent is GHMA for the Malheur S Alternative. Potential direct and indirect effects on Greater Sage-Grouse would be similar to those described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Migratory Birds Including Raptors

Applicant's Proposed Action Alternative

Direct impacts on raptors and other migratory birds during construction could include collision with B2H Project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. Raptors and other migratory birds are particularly sensitive to disturbance during the nesting period and some construction activities could cause nest failure or abandonment. The types of potential effects on raptors and other migratory birds are described in detail at the beginning of Section 3.2.4.6.

Residual impact levels for raptors and other migratory birds have been determined in accordance with the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described under Methods in Section 3.2.4.4. Because removal or disturbance to nesting sites for raptors and other migratory birds could occur, the Applicant's Proposed Action would result in long-term moderate residual impacts on raptors and other migratory birds. Short-term moderate residual impacts on bald and golden eagles would result from disruption of breeding and foraging behavior, and short-term moderate impacts on bald and golden eagles would result from disturbance to nesting sites.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on raptors and other migratory birds include installing flight diverters, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, and conducting preconstruction surveys (refer to Section 3.2.4.4). In addition, adherence to the Applicant's Avian Protection Plan would minimize or avoid impacts from the B2H Project on raptors and other migratory birds.

Variations S5-A1, S5-A2, S5 B-1, and S5-B2

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Malheur S and Malheur A Alternatives

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. Additionally, the risk of in-flight collisions already exists from an existing 500-kV transmission line located along portions of the Malheur S and Malheur A Alternatives. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Big Game

The direct and indirect effects of the B2H Project on big game species could incrementally contribute to other factors preventing mule deer, elk, and pronghorn populations from meeting ODFW's management objectives for these species. However, as described below, design features of the B2H Project for environmental protection and selective mitigation measures will minimize impacts on WMUs and big game habitat.

Table 3-188 presents miles crossed and residual impacts on big game habitats for all alternative routes and route variations in Segment 5. Levels of residual impacts and duration of impacts on big game are described by alternative route and route variation below, and displayed in MV-10. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-188. Big Game Inventory Data and Residual Impacts for Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]			Residual Impacts[2]
		Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range	Low
Applicant's Proposed Action	40.4	12.8	24.6	2.2	38.2
Variation S5-A1	*7.4*	*5.5*	*1.3*	*0.0*	*5.8*
Variation S5-A2	*7.4*	*6.0*	*0.2*	*0.0*	*6.2*
Variation S5-B1	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*
Variation S5-B2	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*
Malheur S	43.5	14.7	20.6	2.2	32.6
Malheur A	43.1	16.4	20.0	2.2	32.0

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High or moderate levels of impacts on big game are not anticipated as a result of B2H Project implementation.

Table 3-189 displays acreage of disturbance in big game habitat for all alternatives and route variations in Segment 5.

Table 3-189. Anticipated Acres of Disturbance for Big Game for Segment 5—Malheur (acres)

Alternative Route	Total Disturbance	Pronghorn Winter Range	Mule Deer Winter Range	Elk Winter Range
Applicant's Proposed Action	884	280	539	48
Variation S5-A1	*141*	*105*	*25*	*0*
Variation S5-A2	*147*	*119*	*4*	*0*
Variation S5-B1	*56*	*0*	*54*	*0*
Variation S5-B2	*57*	*0*	*57*	*0*
Malheur S	974	329	461	49
Malheur A	932	355	432	48

Table Note: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have short- and long-term low residual impacts on mule deer, pronghorn, and elk (MV-10, Table 3-188). Anticipated acres of disturbance to big game are presented in Table 3-189. Short- and long-term residual impacts from the Applicant's Proposed Action would be low because impacts would have only minor adverse effects on mule deer, pronghorn, and elk and would not limit the long-term sustainability of populations.

Direct effects on big game could include vehicle collisions, noise and visual disturbance, and habitat loss and modification. Indirect effects could include increased disturbance to big game from increased human activity from use of new or improved access roads. The types of potential effects on big game are described in detail at the beginning of Section 3.2.4.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on big game are listed in Table 3-140 and include implementing seasonal restrictions, limiting new or improved access to areas previously inaccessible, leaving vegetation in place whenever possible, and reclaiming construction areas with an agency or landowner-approved seed mix (refer to Section 3.2.4.4).

Variations S5-A1 and S5-A2

The variations would have short- and long-term low residual impacts on mule deer and pronghorn. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative. The variations do not cross elk winter range; therefore, impacts on elk winter range would not be anticipated.

Variations S5-B1 and S5-B2

The variations would have short- and long-term low residual impacts on mule deer. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative. The variations do not cross elk or pronghorn winter range; therefore, impacts on pronghorn and elk winter range would not be anticipated.

Malheur S and Malheur A Alternatives

The Malheur S and Malheur A Alternatives would have short- and long-term low residual impacts on mule deer, elk, and pronghorn. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative.

Conclusion

All alternative routes and route variations would result in short-term, long-term, and permanent effects on wildlife habitat and wildlife species. A summary of effects on Columbia spotted frog, Greater Sage-Grouse, migratory birds including raptors, and big game are provided below.

Columbia Spotted Frog

All alternative routes would have low residual impacts from crossing Columbia spotted frog suitable habitat (high potential). In addition, the Malheur S Alternative, Malheur A Alternative, and the Applicant's Proposed Action Alternative with Variation S5-A2 would result in moderate residual impacts from crossing Columbia spotted frog potentially occupied habitat (higher quality). In addition to other direct and indirect effects, habitat loss and fragmentation would occur where these habitat types are crossed by the alternative routes. Design features of the B2H Project for environmental protection and selective mitigation measures, including avoiding or minimizing impacts on RCAs, minimizing the spatial extent of construction activities, limiting new or improved access to areas previously inaccessible, and limiting removal of vegetation, as well as reclamation, would reduce impacts on Columbia spotted frog.

The Malheur S Alternative and Malheur A Alternative would have the same magnitudes of impact on Columbia spotted frog, as they cross the same potentially occupied habitat (higher quality) and the same amount of suitable habitat (high potential), and would have the highest impact on Columbia spotted frog from crossing more habitat overall than the Applicant's Proposed Action Alternative.

Greater Sage-Grouse

All alternative routes cross Greater Sage-Grouse GHMA and would have moderate residual impacts on Greater Sage-Grouse from adverse effects such as loss of habitat, increased avian predation, and habitat avoidance. PHMA would not be crossed by any of the alternative routes and no leks occur within 3.1 miles of any of the alternative routes. In addition to seasonal restrictions implemented during sensitive periods and other avoidance and minimization measures to reduce impacts on Greater Sage-Grouse, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

The Applicant's Proposed Action Alternative would have the lowest impact on Greater Sage-Grouse, as it crosses the least amount of GHMA. Where GHMA is crossed by the Applicant's Proposed Action Alternative, the route follows the outer edge of GHMA, which is closer to anthropogenic disturbances and, thus, represent lower quality habitat. The Malheur A Alternative would have the greatest impact on Greater Sage-Grouse from crossing more GHMA than the other two alternative routes.

Migratory Birds Including Raptors

All alternative routes and route variations would result in moderate residual impacts on raptors and other migratory birds from removal or disturbance to nesting sites, and from the disruption of bald and golden eagle breeding and foraging behavior. Avoidance and minimization measures, including limiting B2H Project activities and implementing spatial restrictions during the nesting season, would reduce impacts on migratory birds during construction and operation of the B2H Project. Removal of and

disturbance to nesting habitat would not negatively affect raptors and other migratory birds appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Habitat disturbed during construction would be reclaimed and would restore migratory bird habitats similar to those disturbed. While the resulting habitats may cause a shift in avian species use, population-level effects on migratory birds are not anticipated to occur.

Compared to other alternative routes, the Applicant's Proposed Action Alternative would have the lowest impacts on bald and golden eagles as it crosses within 0.5 and 5 miles of the fewest number of bald and golden eagle nests, but the Applicant's Proposed Action Alternative would affect the greatest amount of migratory bird habitat overall due to its longer length.

Big Game

All alternative routes would have low residual impacts on big game. In addition to other direct and indirect effects, short- and long-term habitat loss would occur, but would not negatively affect big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Disturbance to big game during sensitive periods would be minimized through the implementation of seasonal restrictions. The Applicant's Proposed Action Alternative would have the greatest impact on big game from crossing more big game habitat than other alternative routes.

Summary

The Applicant's Proposed Action Alternative would result in the least overall impacts on wildlife resources compared to the other alternative routes in Segment 5 because it would result in the least impacts on Columbia spotted frog, Greater Sage-Grouse, and bald and golden eagles. The Applicant's Proposed Action Alternative would result in greater impacts on migratory bird and big game habitat from crossing more habitat than the other alternative routes, but impacts would not negatively affect these species appreciably due to the small amount of habitat affected compared to their large home ranges.

SEGMENT 6—TREASURE VALLEY

Wildlife Habitat

Alternative Routes and Route Variations

The majority of wildlife habitat that would be affected in Segment 6 is shrubland. RCAs also would be affected, but to a lesser extent. The amount of each wildlife habitat type that would be disturbed by the Applicant's Proposed Action Alternative and route variations in Segment 6 is presented in Table 3-137, and residual impacts on each wildlife habitat type is provided in Table 3-136 in Section 3.2.3.

The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6. The primary impact on wildlife habitats would include habitat removal and fragmentation. The Applicant's Proposed Action and route variations in Segment 6 would result in moderate residual impacts on shrubland habitat because they support a wide range of species and are slow to regenerate. Although disturbance to RCAs is anticipated to be largely avoided through spanning and eliminating surface disturbance where feasible (Design Features 15 and 16), the Applicant's

Proposed Action and route variations in Segment 6 would have moderate residual impacts on this valuable wildlife habitat type.

Special Status Species

Alternative Routes and Route Variations

The amount of each wildlife habitat that would be disturbed in Segment 6 is compared by alternative in Table 3-137 in Section 3.2.3. Special status species using wildlife habitats in Segment 6 are described at the beginning of Section 3.2.4.5. Potential effects on special status wildlife species would be similar to potential effects on other wildlife species that use the same habitat types. The types of potential effects on each wildlife habitat type are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on special status wildlife include installing devices to deter raptor perching on transmission line structures and minimize an increase in predation, minimization of removal of trees and other vegetation, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, conducting preconstruction surveys, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

The types of potential effects on special status wildlife species would be similar for the Applicant's Proposed Action Alternative and the route variations. Because mortality of special status species (without population-level effects) and temporary disturbance during critical or sensitive periods could occur (without population-level effects), the Applicant's Proposed Action and route variations in Segment 6 could result in long-term moderate impacts on special status species. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Columbia Spotted Frog

Table 3-190 presents miles crossed and residual impacts on Columbia spotted frog (Great Basin distinct population segment) habitat for the Applicant's Proposed Action Alternative and route variations in Segment 6. Levels of residual impacts and duration of impacts on Columbia spotted frog are described by alternative route and route variation below, and displayed in MV-8. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139).

Table 3-190. Columbia Spotted Frog Inventory Data and Residual Impacts for Segment 6—Treasure Valley (miles crossed)			
Alternative Route	Total Length (miles)	Inventory[1]	Residual Impacts[2]
		Suitable Habitat (High Potential)	Low
Applicant's Proposed Action	28.0	2.1	2.1
Variation S6-A1	*9.3*	*1.0*	*1.0*
Variation S6-A2	*8.9*	*0.3*	*0.3*
Variation S6-B1	*14.4*	*0.7*	*0.7*
Variation S6-B2	14.1	*0.5*	*0.5*

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High and moderate levels of impacts on Columbia spotted frog are not anticipated as a result of B2H Project implementation in Segment 6.

Table 3-191 displays acreage of disturbance to Columbia spotted frog habitat for the Applicant's Proposed Action and route variations.

Table 3-191. Anticipated Acres of Disturbance for Columbia Spotted Frog for Segment 6—Treasure Valley		
Alternative Route	Total Acres of Disturbance	Suitable Habitat (High Potential)
Applicant's Proposed Action	613	46
Variation S6-A1	*205*	*22*
Variation S6-A2	*196*	*7*
Variation S6-B1	*312*	*15*
Variation S6-B2	*309*	*11*

Table Notes: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have long-term low residual impacts on Columbia spotted frog. The only Columbia spotted frog habitat type that the Applicant's Proposed Action Alternative crosses is suitable habitat (high potential); therefore, impacts on other habitat types would not be anticipated. Long-term residual impacts would be low for suitable habitat (high potential) because impacts could have minor adverse effects on Columbia spotted frog, but would not reduce population viability. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-191.

Potential direct effects on Columbia spotted frog could include mortality; modification, fragmentation, and loss of habitat; displacement; and noise-related disturbance. Potential indirect effects on Columbia spotted frog could include alteration of native vegetation through introduction and spread of invasive plants and noxious weeds, increased predation risk, and increased water turbidity from fugitive dust. The types of potential direct and indirect effects on Columbia spotted frog are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Columbia spotted frog are listed in

Table 3-140 and include avoiding or minimizing impacts on RCAs, conducting preconstruction surveys, implementing seasonal and spatial restrictions for sensitive periods and habitats, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4).

Variations S6-A1 and S6-A2

Variations S6-A1 and S6-A2 would have long-term low residual impacts on Columbia spotted frog. The only Columbia spotted frog habitat type that Variation S6-A1 and S6-A2 cross is suitable habitat (high potential); therefore, impacts on other habitat types are not anticipated. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-191.

Potential direct and indirect effects on Columbia spotted frog would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Columbia spotted frog would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B2 would have long-term low residual impacts on Columbia spotted frog. The only Columbia spotted frog habitat type that Variations S6-B1 and S6-B2 cross is suitable habitat (high potential); therefore, impacts on other habitat types are not anticipated. The duration and levels of residual impacts would be the same as the Applicant's Proposed Action Alternative. Anticipated acres of disturbance to Columbia spotted frog habitat are presented in Table 3-191.

Potential direct and indirect effects on Columbia spotted frog would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Columbia spotted frog would be the same as those described for the Applicant's Proposed Action Alternative.

Greater Sage-Grouse

Table 3-192 presents miles crossed and residual impacts on Greater Sage-Grouse habitat for the Applicant's Proposed Action Alternative and route variations in Segment 6. Levels of residual impacts and duration of impacts on Greater Sage-Grouse are described by alternative route and route variation below, and displayed in MV-9. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139).

Table 3-192. Sage-Grouse Inventory Data and Residual Impacts for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]			Residual Impacts[3]	
		Priority Habitat Management Areas	Important Habitat Management Areas[2]	General Habitat Management Areas	High	Moderate
Applicant's Proposed Action	28.0	0.0	22.3	0.0	22.3	0.0
Variation S6-A1	*9.3*	*0.0*	*6.7*	*0.0*	*6.7*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*13.5*	*0.0*	*13.5*	*0.0*
Variation S6-B2	*14.1*	*0.0*	*13.7*	*0.0*	*13.7*	*0.0*

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]Some portions of Important Habitat Management Areas consist of lands that serve as management buffers between developed areas and Priority Habitat Management Areas and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy.
[3]Low levels of impacts on Greater Sage-Grouse are not anticipated as a result of B2H Project implementation.

Table 3-193 displays acreage of disturbance to Greater Sage-Grouse habitat types for the Applicant's Proposed Action Alternative and route variations.

Table 3-193. Anticipated Acres of Disturbance for Greater Sage-Grouse for Segment 6—Treasure Valley

Alternative Route	Total Acres of Disturbance	Priority Habitat Management Areas	Important Habitat Management Areas[1]	General Habitat Management Areas
Applicant's Proposed Action	613	0	488	0
Variation S6-A1	*205*	*0*	*148*	*0*
Variation S6-A2	*196*	*0*	*130*	*0*
Variation S6-B1	*312*	*0*	*292*	*0*
Variation S6-B2	*309*	*0*	*300*	*0*

Table Notes:
Greater Sage-Grouse habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.
[1] Some portions of Important Habitat Management Areas consist of lands that serve as management buffers between developed areas and Priority Habitat Management Areas and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would have direct and indirect impacts on Greater Sage-Grouse habitat in IHMA. No PHMA, GHMA, or leks occur in the study corridor of the Applicant's Proposed Action; therefore, no identifiable impacts on PHMA, GHMA, or leks would be expected.

The Applicant's Proposed Action Alternative would have long-term high residual impacts on Greater Sage-Grouse. Permanent high residual impacts would occur where IHMA is crossed as permanent loss of IHMA and other impacts could result in population-level effects due to the importance of this habitat type in providing a management buffer for the PHMA. However, portions of IHMA crossed are lands that serve as management buffers for Priority Habitat Management Areas and to connect patches of Priority Habitat Management Areas, and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy. Therefore, in some areas, identifiable impacts on Greater Sage-Grouse habitat in IHMA would not be expected. Anticipated acres of disturbance to Greater Sage-Grouse habitat are presented in Table 3-193.

Potential direct effects on Greater Sage-Grouse could include mortality due to electrocution; in-flight collisions with transmission line infrastructure; collisions with construction and maintenance vehicles; fragmentation of habitats due to the introduction of tall structures, increased EMFs, and construction of new roads; loss and degradation of habitat quality and function; disturbance to breeding activities due to increased human presence and noise at lek locations; disturbance during sensitive periods resulting from human presence, vehicle use, and noise during construction and maintenance; and interruption and/or alteration of seasonal migrations and movements among populations.

Along with the direct effects that would be expected in the footprint of the Applicant's Proposed Action Alternative, indirect effects on Greater Sage-Grouse would be anticipated in a 3.1-mile buffer around the route centerline, of which 2.4 percent is GHMA and 49.5 percent is IHMA. Indirect effects on Greater Sage-Grouse could include alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds; avoidance of habitat due to potential increase in raptor predation pressure; disruption of nesting and breeding activities and avoidance of habitat due to vehicle noise and human presence resulting from public use of new access roads; increased mammalian predation risk; increased raptor and raven predation risk; and alteration of behavioral patterns due to increased predation pressure. The types of potential direct and indirect effects on Greater Sage-Grouse are described in detail at the beginning of Section 3.2.4.6.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on Greater Sage-Grouse are listed in Table 3-140 and include installing devices to deter raptor perching on transmission line structures, minimizing electrocution and collision through avian-safe design standards (APLIC 2006, 2012), conducting preconstruction surveys, implementing seasonal restrictions for sensitive periods and habitats, and limiting new or improved access to areas previously inaccessible (refer to Section 3.2.4.4). Seasonal restrictions for Greater Sage-Grouse would be similar to the seasonal restrictions identified in the Oregon ARMPAs (refer to Appendix B). Moreover, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

Variations S6-A1 and S6-A2

No leks, PHMA, or GHMA are in the study corridors of the variations and, therefore, identifiable impacts on leks, PHMA, and GHMA would not be expected. Variations S6-A1 and S6-A2 do cross IHMA; however, portions of IHMA crossed are lands that serve as management buffers for Priority Habitat Management Areas and to connect patches of Priority Habitat Management Areas, and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy.

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B2 would have direct and indirect impacts on Greater Sage-Grouse habitat in IHMA. No leks, PHMA, or GHMA occur in the study corridor of the Applicant's Proposed Action Alternative and, therefore, identifiable impacts on PHMA, GHMA, and leks would not be expected.

Along with the direct effects that would be expected in the footprint of the variations, indirect effects on Greater Sage-Grouse would be anticipated in a 3.1-mile buffer around the variations' centerline, of which 38.9 percent is IHMA and 4.1 percent is GHMA for Variation S6-B1, and 37.5 percent is IHMA and 2.8 percent is GHMA for Variation S6-B2. Types of potential direct and indirect effects on Greater Sage-Grouse would be similar to those described for the Applicant's Proposed Action Alternative.

The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on Greater Sage-Grouse would be the same as those described for the Applicant's Proposed Action Alternative.

Migratory Birds Including Raptors

Applicant's Proposed Action Alternative

Direct impacts on raptors and other migratory birds during construction could include collision with B2H Project structures, electrocution, disturbance due to construction noise, fugitive dust, and visual disturbance. Raptors and other migratory birds are particularly sensitive to disturbance during the nesting period and some construction activities could cause nest failure or abandonment. The types of potential effects on raptors and other migratory birds are described in detail at the beginning of Section 3.2.4.6.

Residual impact levels for raptors and other migratory birds have been determined in accordance with the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4. Because removal or disturbance to nesting sites for raptors and other migratory birds could occur, the Applicant's Proposed Action Alternative would result in long-term moderate residual impacts on raptors and other migratory birds. Short-term moderate residual impacts on bald and golden eagles would result from disruption of breeding and foraging behavior, and short-term moderate impacts on bald and golden eagles would result from disturbance to nesting sites.

Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize or avoid impacts from the B2H Project on raptors and other migratory birds include installing flight diverters, minimization of removal of trees and other vegetation, minimizing electrocution

and collision through avian-safe design standards (APLIC 2006, 2012), limiting construction and maintenance activities during migratory bird nesting season, implementing seasonal and spatial restrictions for sensitive periods and habitats, and conducting preconstruction surveys (refer to Section 3.2.4.4). In addition, adherence to the Applicant's Avian Protection Plan would minimize or avoid impacts from the B2H Project on raptors and other migratory birds.

Variations S6-A1, S6-A2, S6-B1, and S6-B2

The types of potential effects on raptors and other migratory birds and residual impact levels would be similar to those described for the Applicant's Proposed Action Alternative. The design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on raptors and other migratory birds would be the same as those described for the Applicant's Proposed Action Alternative.

Big Game

The direct and indirect effects of the B2H Project on big game species could incrementally contribute to other factors preventing mule deer and bighorn sheep populations from meeting ODFW's and IDFG's management objectives for these species. However, as described below, design features of the B2H Project for environmental protection and selective mitigation measures will minimize impacts on WMUs and big game habitat.

Table 3-194 presents miles crossed and residual impacts on big game habitats for the Applicant's Proposed Action Alternative and route variations in Segment 6. Levels of residual impacts and duration of impacts on big game are described by alternative route and route variation below, and displayed in MV-10. Residual impact levels are based on the criteria for assessing level of impacts on wildlife (Table 3-139) and duration of impacts follow the criteria described in Section 3.2.4.4.

Table 3-194. Big Game Inventory Data and Residual Impacts for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Inventory[1]		Residual Impacts[2]
		Bighorn Sheep Population Management Units	Mule Deer Winter Range	Low
Applicant's Proposed Action	28.0	17.5	8.0	21.3
Variation S6-A1	*9.3*	*6.7*	*2.3*	*9.0*
Variation S6-A2	*8.9*	*6.8*	*1.9*	*8.7*
Variation S6-B1	*14.4*	*10.8*	*4.2*	*10.8*
Variation S6-B2	*14.1*	*13.2*	*4.8*	*13.2*

Table Notes:
[1]Miles crossed will not equal the total length as habitat may not be contiguous over the entire alternative route.
[2]High or moderate levels of impacts on Big Game are not anticipated as a result of B2H Project implementation.

Table 3-195 displays acreage of disturbance in big game habitat for the Applicant's Proposed Action Alternative and route variations in Segment 6.

Table 3-195. Anticipated Acres of Disturbance for Big Game for Segment 6—Treasure Valley (acres)			
Alternative Route	**Total Disturbance**	**Bighorn Sheep Population Management Units**	**Mule Deer Winter Range**
Applicant's Proposed Action	613	383	175
Variation S6-A1	*205*	*148*	*51*
Variation S6-A2	*196*	*150*	*42*
Variation S6-B1	*312*	*234*	*91*
Variation S6-B2	*309*	*289*	*105*
Table Notes: Habitat may not be contiguous over the entire alternative route, and disturbance to habitat may not equal total disturbance. Acres in the table are rounded and, therefore, columns may not sum exactly.			

Applicant's Proposed Action Alternative

The Applicant's Proposed Action would have short- and long-term low residual impacts on mule deer and bighorn sheep (MV-10, Table 3-194). Anticipated acres of disturbance to big game are presented in Table 3-195.

Short- and long-term residual impacts from the Applicant's Proposed Action would be low because impacts would have only minor adverse effects on mule deer and bighorn sheep and would not limit the long-term sustainability of populations.

Direct effects on big game could include vehicle collisions, noise and visual disturbance, and habitat loss and modification. Indirect effects could include increased disturbance to big game from increased human activity from use of new or improved access roads. The types of potential effects on big game are described in detail at the beginning of Section 3.2.4.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts from the B2H Project on big game are listed in Table 3-140 and include implementing seasonal restrictions, limiting new or improved access to areas previously inaccessible, leaving vegetation in place whenever possible, and reclaiming construction areas with an agency or landowner-approved seed mix (refer to Section 3.2.4.4).

Variations S6-A1 and S6-A2

The variations would have short- and long-term low residual impacts on mule deer and bighorn sheep. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative. The variations do not cross other big game habitat types; therefore, impacts on other habitat types would not be anticipated.

Variations S6-B1 and S6-B2

The variations would have short- and long-term low residual impacts on mule deer and bighorn sheep. The types of potential effects on big game, the design features of the B2H Project for environmental protection, and the selective mitigation measures that would minimize impacts from the B2H Project on big game would be the same as those described for the Applicant's Proposed Action Alternative. The

variations do not cross other big game habitat types; therefore, impacts on other habitat types would not be anticipated.

Conclusion

The Applicant's Proposed Action Alternative and route variations would result in short-term, long-term, and permanent effects on wildlife habitat and wildlife species. A summary of effects on Columbia spotted frog, Greater Sage-Grouse, migratory birds including raptors, and big game are provided below.

Columbia Spotted Frog

The Applicant's Proposed Action Alternative and route variations would have low residual impacts from crossing Columbia spotted frog suitable habitat (high potential). In addition to other direct and indirect effects, habitat loss and fragmentation would occur where suitable habitat is crossed. Design features of the B2H Project for environmental protection and selective mitigation measures, including avoiding or minimizing impacts on RCAs, minimizing the spatial extent of construction activities, limiting new or improved access to areas previously inaccessible, and limiting removal of vegetation, as well as reclamation, would reduce impacts on Columbia spotted frog.

Variation S6-A1 would have greater impacts than Variation S6-A2, as more suitable habitat (high potential) is crossed. Variation S6-B1 would have greater impacts than Variation S6-B2 as more suitable habitat (high potential) is crossed.

Greater Sage-Grouse

The Applicant's Proposed Action Alternative and route variations do not cross Greater Sage-Grouse PHMA or GHMA but do cross IHMA. No leks occur within 3.1 miles of any of the route variations. In addition to seasonal restrictions implemented during sensitive periods and other avoidance and minimization measures to reduce impacts on Greater Sage-Grouse, the B2H Project would be required to achieve a net conservation gain for Greater Sage-Grouse through compensatory mitigation as described in the Mitigation Framework (Appendix C).

The IHMA crossed by Variations S6-A1 and S6-A2 are not identified as lands used by Greater Sage-Grouse, but are lands that serve as management buffers for PHMA and to connect patches of PHMA. Therefore, identifiable impacts on Greater Sage-Grouse habitat in IHMA would not be expected. The IHMA crossed by Variations S6-B1 and S6-B2 contains land identified as used by Greater Sage-Grouse. Variation S6-B1 is closer to the existing 500-kV transmission line than Variation S6-B2 and is closer to the edge of IMHA, and may therefore be located in an area of lower quality habitat.

Migratory Birds Including Raptors

The Applicant's Proposed Action Alternative and route variations would result in moderate residual impacts on raptors and other migratory birds from removal or disturbance to nesting sites, and from the disruption of bald and golden eagle breeding and foraging behavior. Avoidance and minimization measures, including limiting B2H Project activities and implementing spatial restrictions during the nesting season, would reduce impacts on migratory birds during construction and operation of the B2H

Project. Removal of and disturbance to nesting habitat would not negatively affect raptors and other migratory birds appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Habitat disturbed during construction would be reclaimed and would restore migratory bird habitats similar to those disturbed. While the resulting habitats may cause a shift in avian species use, population-level effects on migratory birds are not anticipated to occur.

For each variation option, the variations would affect similar amounts of migratory bird habitat overall due to their similar lengths. Variation S6-A1 would have a higher impact on bald and golden eagles than Variation S6-A2, as Variation S6-A1 crosses within 0.5 mile of bald and golden eagle nests and Variation S6-A2 does not. Variation S6-B1 would have a higher impact on bald and golden eagle than Variation S6-B2 from crossing within 0.5 mile of a greater number of bald and golden eagle nests.

Big Game

The Applicant's Proposed Action Alternative and route variations would have low residual impacts on big game. In addition to other direct and indirect effects, short- and long-term habitat loss would occur, but would not negatively affect big game appreciably due to the small amount of habitat affected compared to the large home ranges of these species. Disturbance to big game during sensitive periods would be minimized through the implementation of seasonal restrictions. Variations S6-A1 and S6-A2 would have similar impacts on big game from crossing a similar amount of big game habitat. Variation S6-B1 would have lower impacts on big game than Variation S6-B2 from crossing less big game habitat.

Summary

Variation S6-A2 would result in the least overall impacts on wildlife resources compared to Variation S6-A1 as it would result in the least impacts on Columbia spotted frog, Greater Sage-Grouse, and bald and golden eagles. Neither Variation S6-B1 nor Variation S6-B2 would clearly result in the least overall impacts on wildlife resources. Variation S6-B1 would have the least impacts on Greater Sage-Grouse and big game, but would result in greater impacts on Columbia spotted frog and bald and golden eagles.

3.2.5 FISH RESOURCES

3.2.5.1 INTRODUCTION

This section describes the affected environment and environmental consequences of construction, operation, and maintenance of the B2H Project on fisheries resources. The B2H Project would pass through multiple fish habitat types that currently are occupied by native resident and migratory fish species and would overlap with known habitats for special status fish species. Fish species and habitat analyzed include ESA threatened, endangered, candidate, and proposed species and designated critical habitat; Essential Fish Habitat (EFH); other resident and anadromous fish species; and BLM, USFS, and state sensitive species.

3.2.5.2 REGULATORY FRAMEWORK

FEDERAL

Endangered Species Act

The ESA (16 U.S.C. 1531–1544), as amended, established broad protection for species that are at risk of extinction. Species listed under the ESA are protected from any action that would constitute harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting the species and from any attempt to engage in any such conduct. Section 7 of the ESA requires that federal agencies, in consultation with the USFWS and the National Oceanic and Atmospheric Administration (NOAA) Fisheries (also called the NMFS), must ensure that any action authorized, funded, or carried out by the federal agency is not likely to jeopardize the continued existence of an endangered, threatened, or proposed listed species or result in the destruction or adverse modification of a critical habitat of a species. Agencies are required to use the best scientific and commercial data available to fulfill this charge.

The USFWS and NOAA Fisheries share responsibility for implementing the Federal ESA as it relates to fish. In general, the USFWS has oversight of terrestrial and resident freshwater species, and the NOAA Fisheries has oversight of marine and anadromous species.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, establishes procedures intended to identify, conserve, and enhance EFH for those species regulated under a federal fisheries management plan. The MSA requires federal agencies to consult with NOAA Fisheries regarding actions or proposed actions that may adversely affect EFH (Section 305(b)(2)). EFH is defined under the MSA as those waters and substrate necessary to fish for “spawning, breeding, and feeding, for growth to maturity.”

PACFISH and INFISH Strategies

The Interim Strategy for Managing Anadromous Fish-Producing Watersheds in Western Oregon and Washington, Idaho, and Portions of California (PACFISH) (USFS and BLM 1995) and the Interim Strategies for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada (INFISH) (USFS 1995), as well as biological opinions and

the Updated Interior Columbia Basin Strategy–Memorandum #1920 (BLM/EPA/USFS/USFWS/NOAA 04/18/2014), provide the components (goals, objectives, standards, guidelines, and hierarchical analysis) needed to protect and conserve steelhead, salmon, and inland native fish and their habitats on BLM- and USFS-administered lands. PACFISH and INFISH were developed as ecosystem-based interim strategies designed to arrest the degradation of habitat and begin the restoration of aquatic habitat and riparian areas on lands administered by the USFS and BLM. The intent of the strategies is to restore the ecological health and productivity of watersheds that contain present or potential anadromous and inland native fish habitat. The Finding of No Significant Impact for the Environmental Assessment in the Decision Notice/Decision Record for these interim strategies amended LUPs in the planning area for this EIS. The BLM Oregon/Washington and the Idaho state directors directed the BLM administrative units to apply the INFISH strategy in watersheds that contain current bull trout habitat (BLM 1995). PACFISH and INFISH remain in place until longer-term management strategies are completed.

The PACFISH and INFISH strategies include the following components: riparian goals, watershed-scale riparian management objectives (RMOs), riparian habitat conservation areas (RHCAs), standards and guidelines, key watersheds, and watershed analysis. Riparian goals provide management context for proposed activities. Watershed-scale RMOs for stream channel, riparian, and watershed conditions are numeric criteria that describe the features of good aquatic habitat and were developed to provide the criteria against which attainment, or progress toward attainment, of the riparian goals are measured. RMOs provide the target toward which managers will be aiming as they conduct resource management activities across the landscape. PACFISH and INFISH require that proposed actions within RHCAs do not prevent or retard attainment of RMOs. RHCAs are portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. More detailed discussion on RHCAs can be found within Sections 3.2.2-Water and 3.2.3-Vegetation.

Additional riparian area protections are outlined in Oregon's Forest Practices Act and OAR 629-635 and 629-640 as summarized below in the *Oregon Regulation of Riparian Vegetation* subsection.

Conservation Agreement for Pacific Lamprey

The Conservation Agreement for Pacific lamprey (*Entosphenus tridentatus*) in the States of Alaska, Washington, Oregon, Idaho, and California 2012 (Agreement Number BLM-OR930-1225) was developed as a cooperative effort between natural resource agencies and tribes to reduce threats to Pacific lamprey and improve associated habitats and population status. Cooperative efforts through the Agreement are intended to (a) develop regional implementation plans derived from existing information and plans, (b) implement conservation actions, (c) promote scientific research, and (d) monitor and evaluate the effectiveness of those actions. Additionally, BMPs to minimize adverse effects on Pacific lamprey (USFWS 2010) would be incorporated into any stream-disturbing activity (e.g., aquatic habitat restoration, prescribed fire, recreational development, grazing, gravel extraction/mining, water diversions, etc.) on USFS- and BLM-managed lands throughout the range of Pacific lamprey.

Special Status Species Management

Both the USFS and the BLM have established lists of species they consider "at risk" on lands they manage. BLM Manual 6840 provides the BLM's special status species management policy and guidance for the conservation of special status species and their habitats. BLM sensitive species are managed under the special status species policy to ensure that actions taken by the BLM are consistent with the conservation of special status species and do not contribute to the listing of any species under the Federal ESA. USFS Manual 2670 directs each regional forester to designate sensitive species on public lands administered by the USFS. Per the manual, sensitive species are defined as "plant or animal species identified by a regional forester for which population viability is a concern, as evidenced by a significant current or predicted downward trend in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution."

U.S. FOREST SERVICE MANAGEMENT INDICATOR SPECIES

The USFS also designates MIS. USFS Manual 2620.5(1) (USFS 1991) defines MIS as "plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent." Each national forest designates its own list of MIS. The Wallowa-Whitman National Forest has five MIS or groups that could occur in the B2H Project area. Two fish species in the B2H Project area are identified as MIS: the redband trout (*O. mykiss gairdneri*) and steelhead (*Oncorhynchus mykiss)*. A USFS report on aquatic MIS in the Wallowa-Whitman National Forest is included in Appendix F.

STATE

Comprehensive Wildlife Conservation Strategies

The IDFG and ODFW have published comprehensive wildlife conservation strategies aimed at encouraging land-managing activities that conserve and enhance wildlife habitat (IDFG 2005; ODFW 2006). These state conservation strategies were established to create a conservation plan to conserve the states' species of greatest conservation need and to provide a common framework that would enable conservation partners (federal, state, and private) to jointly implement a long-term approach for the benefit of those species. The conservation strategies (also known as conservation plans) are not regulatory documents, so they are not intended to be prescriptive, and the species identified are not equivalent to an official state listing as threatened, endangered, or fully protected. However, these conservation strategies do identify species of greatest conservation need, identify the key habitats for each species and the regions within the state where they can be found, recommend actions to improve species' population status and habitat conditions, and describe an approach for long-term monitoring of species. In general, the species identified as species of greatest conservation need are those that have demonstrated a conservation need (due to population or habitat conditions) or where demographic data are lacking. The 2005 Oregon Comprehensive Wildlife Conservation Strategy lists 224 species of greatest conservation need, which include 166 vertebrate species and 58 invertebrate species (ODFW

2006). A revised Wildlife Conservation Strategy for Oregon is currently under review by the USFWS. The Idaho Comprehensive Wildlife Conservation Strategy establishes 229 species of greatest conservation need, which include 126 vertebrate species and 103 invertebrate species (IDFG 2005). The IDFG is in the process of drafting a new state wildlife action plan that will supersede the comprehensive wildlife conservation strategies, but the plan has not been released at this time.

Fish species present in the B2H Project area that are addressed in the comprehensive wildlife conservation strategies include steelhead, redband trout, bull trout (*Salvelinus confluentus*), coho salmon (*O. kisutch*), Pacific lamprey, and Chinook salmon (O. *tshawytscha*).

Idaho Stream Channel Protection Act (Idaho Code Title 42, Chapter 38)

The Idaho Stream Channel Protection Act (Idaho Code Title 42, Chapter 38) protects streams from modifications that would adversely affect their ability to provide habitat for fish and wildlife. The IDWR must approve in advance any work being done on continuously flowing streams, and a permit is required before beginning any work that would alter a stream channel.

Oregon Fish Passage Regulations

The Oregon Fish Passage regulations (ORS 509.580 through 910 and OAR 635, Division 412) provide for the protection of upstream and downstream native migratory fish passage. The regulations prohibit construction of artificial obstructions across any waters that currently are inhabited or historically were inhabited by native migratory fish without providing for passage for the fish. At minimum, new stream crossings on fish-bearing streams must adhere to the ODFW fish passage design standards. If these new structures are to be located on streams with ESA-listed fish species, the structures also must adhere to NMFS/USFWS design standards.

Clean Water Act

Oregon also has regulations governing removal of or placement of fill in streams and wetlands. These regulations are implemented by the ODSL and the ODFW to protect streams and wetlands (ORS 196.795-990). Oregon regulations as well as federal regulations for removal of or placement of fill in streams and wetlands are described in more detail in Section 3.2.2.2.

Oregon Endangered Species Act

The Oregon ESA of 1987 requires state agencies to develop programs to manage and protect endangered species and to follow guidelines for threatened species. Responsibility for these species falls to the ODFW. Species can be Oregon state listed as endangered or threatened, proposed as endangered or threatened, or a candidate for listing (ORBIC 2010). The ODFW also maintains a sensitive species list, under which species can be designated critical or vulnerable. Critical sensitive species are imperiled with extirpation from a specific geographic area of the state because of small population sizes, habitat loss or degradation, and/or immediate threats. Critical species may decline to the point of qualifying as endangered or threatened if conservation actions are not taken. Vulnerable sensitive species are facing one or more threats to their populations and/or habitats. Vulnerable species

are not currently imperiled with extirpation from a specific geographic area or the state but could become so with continued or increased threats to populations or habitats, or both (ORBIC 2010). The Oregon ESA and implementing regulations limit disturbances to sensitive species and establish penalties for violations. The regulations would affect both the locations and operations of B2H Project facilities.

Oregon Habitat Mitigation Policy

The ODFW's Habitat Mitigation Policy (OAR 635-415-000) requires or recommends mitigation for impacts on or losses of fish and wildlife habitat caused by development projects. Development projects may include, but are not limited to, the planning, construction, and operational activities of local, state, and federal agencies. Priority for mitigation actions shall be given to habitat of native fish and wildlife species. Mitigation can involve habitat restoration, the posting of a bond, mitigation banks, or other means, depending on the habitat category of the affected area.

Oregon Regulation of Riparian Vegetation

Oregon's Forest Practices Act and OAR 629-635 and 629-640 regulate the protection of riparian management areas and streamside vegetation on private lands. The purpose of OAR 629-635 is to protect water while focusing on measures in riparian areas to maintain and improve, where necessary, water quality parameters necessary to provide fish habitat. OAR 629-640-0400 defines specific instructions for retaining vegetation along streams and within riparian management areas. Prior to construction activities, these plans must be developed and reviewed by the state to ensure compliance with riparian protection measures.

3.2.5.3 Issues Identified for Analysis

The following list summarizes the fisheries-related issues that were raised by the public, Native American tribes, or federal and state agencies during scoping, as well as the issues that must be considered as stipulated by laws or regulations.

- Would proposed B2H Project activities result in loss of riparian vegetation that would affect stream temperature, organic input, large woody debris supply, or stream bank stability? Would these changes be temporary or permanent?
- Would there be in-stream sediment increases from road and right-of-way construction and ongoing road runoff that would affect fish?
- Could hazardous substances in runoff, such as oils and herbicides from construction and maintenance-related activities, affect fish?
- Would new stream-crossing activities like culvert installation impede fish passage?
- Could stream-crossing structures impede natural large woody debris, water, or sediment movement?
- What precautions would be taken to prevent invasive aquatic species from being introduced from construction, operations, and maintenance actions? How would stream crossings modify fish habitat? Would adding hard bank structures reduce habitat quality?

- What would be the effects of in-stream construction on fish that may be present in the crossing area?
- Would water withdrawals from streams entrain or impinge fish?
- What effects would blasting near or in streams have on fish?
- Would tribes' access to fish be affected by construction, operation, and/or decommissioning of the B2H Project?
- How would the use of herbicide affect fish species?

3.2.5.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.3 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on fish.

DATA SOURCES

Initial methods to determine stream areas with fish resources of concern included examining existing literature and analysis of the B2H Project relative to streams crossed or potentially affected. GIS analyses were conducted to determine fish distributions by species and facility intersections with streams. The analyses included obtaining the best available geospatial data on fish distribution (current) and overlaying the B2H Project. Information on fish presence in many streams outside those containing anadromous fish was limited, so assumptions were made concerning where fish likely were present. These assumptions were based on species habitat requirements, known regional distributions, and historic distribution information. Species-specific field surveys were not conducted for this EIS to determine presence, absence, or abundance for any fish species.

Streams crossed by the B2H Project and fish species present in these streams were determined from several sources. The location of the Proposed Action relative to stream locations initially was determined through analysis of the transmission line centerlines and GIS layers. The stream database from the NHD layer was used to determine presence of perennial, intermittent, and ephemeral streams as defined in the NHD. Locations of fish and their life stages primarily were determined through the StreamNet database and ODFW online database; the Oregon Department of Forestry stream database, which classifies streams as fish or non-fish streams; Chinook salmon data from the Confederated Tribes of the Umatilla Indian Reservation (CTUIR); and the IDEQ stream-type designation. Also, GIS data acquisition focused on obtaining the current and potential historical distribution of ESA-listed species, designated critical habitat, and EFH. Information was gathered at the subwatershed level. A subwatershed is defined as a sixth-level HUC (12 digit code).The list of special status fish species was derived by compiling lists of federal endangered, threatened, and candidate species that occur in Oregon and Idaho from the NOAA Fisheries and USFWS; state listed as endangered, threatened, and sensitive species in Oregon, and sensitive USFS and BLM species that occur in Oregon and Idaho. This list was narrowed down to only species that have ranges overlapping the B2H Project area or, for rarer species, those with observation locations and/or suitable habitat within the B2H Project area.

Staff biologists reviewed the developed layers and additional data, and made additions based on stream characteristics and known proximity to fish streams. The fish distribution was then further refined through review by state and federal agency personnel, as well as tribal biologists, who provided additional information about historical and current fish distribution, including lamprey. Federal agency reviewers included Richard Pastor, June Galloway, and Jason Sutter of the BLM and Brad Lovatt of the USFS. State agency reviewers included Tim Bailey and Nigel Seidel of ODFW. Information gained from the agency review was used to further modify and finalize the fish distribution layer.

Analysis Area

In general, the analysis area (study corridor) used for the assessment of fish resources consists of fish-bearing streams crossed by the centerline of all alternative routes and route variations and potential fish-bearing stream segments 1,000 feet downstream and 1,000 feet upstream of all such crossings, as well as approximately 300 feet distance on either side of the stream.

Impact Assessment and Mitigation Planning

Criteria for Assessing Level of Impacts

The criteria used to assess impacts were developed collaboratively with the cooperating agencies to assess the level of potential impacts on fish resources associated with B2H Project implementation and to allow comparison of the alternative routes. Impact criteria were determined with consideration of a species' legal status, regulatory protection, and susceptibility to temporary or permanent disturbances. Table 3-196 summarizes the criteria used to assess impacts on fish resources.

Table 3-196. Criteria for Assessing Intensity of Impacts on Fish Resources

Intensity of Impacts	Description
High	• Mortality of a federally endangered, threatened, or candidate fish species • Mortality of sensitive and other nonlisted fish or permanent displacement from habitat that results in population-level effects • Permanent displacement of federally endangered, threatened, or candidate fish from the habitats on which they depend • Permanent loss of habitat that results in population-wide effects on nonlisted fish • Permanent loss or modification of designated critical or suitable habitat for federally endangered, threatened, or candidate fish • Permanent loss or modification of riparian or aquatic habitat
Moderate	• Impacts that have adverse effects on aquatic species but do not severely limit the long-term sustainability of populations • Permanent loss of suitable habitat for sensitive fish • Mortality of sensitive fish that does not reduce population viability • Disturbance to nonlisted fish during a critical or sensitive period • Permanent displacement of nonlisted fish from important occupied or suitable habitat that does not have population-level effects • Temporary disturbance of sensitive or federally endangered, threatened, candidate, or proposed fish species • Temporary loss or modification of riparian or aquatic habitats that provide value to native fish

Table 3-196. Criteria for Assessing Intensity of Impacts on Fish Resources	
Intensity of Impacts	**Description**
Low	• Impacts that have only minor adverse effects on species and do not limit the long-term sustainability of populations (e.g., indirect effects or impacts in areas of preexisting disturbance) • Loss of suitable habitat for nonlisted species that does not result in population-level effects • Limited or incidental mortality of nonlisted species that does not result in population-level effects • Temporary displacement of nonlisted fish from seasonal habitats • Temporary loss or modification of riparian or aquatic habitat that provide little value to fish

Effects Analysis

Assessment of Initial Impacts

Initial impacts are those effects resulting from the implementation of the B2H Project, with consideration of design features of the B2H Project for environmental protection. These design features would be implemented throughout the B2H Project area and are expected to reduce initial impacts on fish resources. Initial impacts on fish resources were assigned using the criteria for assessing impacts identified in Table 3-196. The design features relevant to fish resources are summarized below.

- ***Design Feature 1 (Plan of Development)***. A POD would be prepared for implementation and maintenance of the B2H Project to provide direction to the Applicant's construction personnel, construction contractors and crews, CIC, environmental monitors, and agency personnel regarding specification of construction and to provide direction to the agencies and Applicant's personnel for operation and maintenance of the B2H Project. The POD would contain implementation plans and detailed mapping to facilitate execution of environmental protection, selective mitigation measures, and conservation measures.

  The implementation plans, prepared based on requirements from land-managing and/or regulatory agencies, would outline the direction for adhering to the requirements during construction, operation, and maintenance of the B2H Project. The plans would contribute to avoiding, minimizing, rectifying, reducing, eliminating, or compensating for effects of the B2H Project on the environment. The plans would be incorporated into the POD, which would be approved by the agencies prior to commencing construction. Execution of the POD would be a condition of the ROD and stipulation for the right-of-way grant and other authorizations.
- ***Design Feature 2 (Environmental Training for All Personnel)***. Prior to construction, the CIC would instruct all personnel on the protection of cultural, paleontological, ecological, and other natural resources such as (a) federal and state laws regarding antiquities, paleontological resources, and plants and wildlife, including collection and removal; (b) the importance of these resources; (c) the purpose and necessity of protecting them; and (d) reporting and procedures for stop work.

  This procedure is mandatory to educate all construction and maintenance personnel on the requirements for environmental protection during construction and for maintenance activities set

forth in the POD, with the intent of avoiding, minimizing, reducing, or eliminating effects on the environment.

- ***Design Feature 4 (Preconstruction Surveys for Sensitive Species)***. Preconstruction surveys for special status species, threatened and endangered species, or other species of particular concern would be considered in accordance with the B2H Biological Survey Work Plan, which was previously approved by the Applicant and the appropriate land-managing or wildlife-management agencies (e.g., BLM, USFWS, state wildlife agencies, etc.). In cases for which such species are identified, appropriate action would be taken to avoid adverse impacts on the species and its habitat. Amendments to the work plan would be made based on the best available science. Surveys for fish species are not anticipated; fish species will be presumed present in all watersheds that agency data indicate presence.

  While the surveys or the results of the surveys are not measures that avoid, reduce, minimize, or eliminate over-time effects on the special status species, the results of the surveys would be used to generate professional recommendations for mitigation and/or conservation measures to protect the species. The resulting mitigation and/or conservation measures would be incorporated into the POD.

- ***Design Feature 5 (Spatial Extent of Construction Activities)***. The spatial limits of construction activities, including vehicle movement, would be predetermined with activity restricted to and confined within those limits. No paint or permanent discoloring agents indicating survey or construction limits would be applied to rocks, vegetation, structures, fences, etc.

  Restricting all construction activities and vehicle movement to the areas granted for right-of-way, easement, and special-use authorization would avoid disturbance outside the area granted. Also, this design feature precludes use of permanent discoloring agents inside or outside the area granted for the B2H Project.

- ***Design Feature 9 (Use of Access Routes Outside of Right-of-Way)***. All vehicle movement outside the right-of-way would be restricted to predesignated access, contractor-acquired access, public roads, overland travel routes, or crossings of streams approved in advance by the applicable land-managing agency or landowner.

  Similar to Design Feature 4, restricting vehicle movement would preclude disturbance outside areas essential for B2H Project-related travel to avoid B2H Project effects outside of the right-of-way.

- ***Design Feature 15 (Reduce Impacts on Riparian Areas)***. Consistent with the BLM and USFS riparian management policies, surface-disturbing activities would be avoided in defined segments of Riparian Conservation Areas[1], using the following delineation criteria, unless exception criteria defined by the BLM are met or with agency approval of acceptable measures

[1]Distances represent default Riparian Conservation Area widths recommended in PACFISH, and are consistent with PACFISH (BLM/USFS 02/24/1995) and INFISH (USFS 07/28/1995) strategies, and the Updated Interior Columbia Basin Strategy – Memorandum Number 1920 (BLM/EPA/USFS/USFWS/NOAA 4/18/2014).

to protect riparian resources and habitats by avoiding or minimizing stormwater runoff, sedimentation, and disturbance of riparian vegetation, habitats, and wildlife species:

- Fish-bearing streams: 300 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest.
- Perennial non-fish-bearing streams: 150 feet slope distance on either side of the stream, or to the extent of additional delineation criteria, whichever is greatest.
- Ponds, lakes, reservoirs, and wetlands greater than 1 acre: 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs, or from the edge of the wetland, pond or lake, or to the extent of additional delineation criteria, whichever is greatest.
- Intermittent or seasonally flowing streams and wetlands greater than 1 acre: In watersheds that support ESA-listed fish species and/or designated critical habitat, 100 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest.
- In watersheds that do not have current, documented presence of ESA-listed fish species and/or designated critical habitat, 50 feet slope distance from the edge of the stream channel or wetland to the outer edge of riparian vegetation, whichever is greatest.

Mitigation measures, such as micro-siting road locations, would be developed on a site-specific basis, in consultation and coordination with the BLM and other federal land-managing agencies, and incorporated into the final POD. This would reduce potential for direct and indirect impacts on riparian areas and the vegetation, fish, and wildlife habitats associated with them by avoiding, minimizing, reducing, and/or eliminating over-time modification of these areas through development of site-specific mitigations.

- ***Design Feature 16 (Span Riparian Communities/Water Courses)***. Based on biological resources surveys and results of Section 7 consultation (with USFWS and NMFS), state and federally designated sensitive plants, fisheries, habitat, wetlands, riparian areas, springs, wells, water courses, or rare/slow regenerating vegetation communities would be flagged and structures would be placed to allow spanning of these features, where feasible, within the limits of standard structure design. Surveys for fish species are not anticipated; fish species will be presumed present in all watersheds that agency data indicate presence.

  Spanning riparian communities and/or water courses would avoid, minimize and/or reduce potential for impacts on riparian areas and water courses by siting B2H Project facilities outside of these areas.

- ***Design Feature 17 (Work During Wet Periods)***. If work were required during wet periods with saturated soil conditions, vehicles would not be allowed to travel when soils are moist enough for deep rutting (4 or more inches deep) to occur unless prefabricated equipment pads (matting) were installed over the saturated areas or other measures were implemented to prevent rutting. Equipment with low-ground-pressure tires, wide tracks, or balloon tires would be used when possible.

This would avoid, minimize, and/or reduce potential for impacts on riparian and soil resources by avoiding work in these areas during wet periods and/or by taking measures that would reduce and minimize disturbance of these areas if work in them could not be avoided during wet periods.

- ***Design Feature 18 (Crossing of Dry Washes)***. Crossings of dry washes would be made during dry conditions, when possible. Repeated crossings would be limited to the extent possible but constrained to the same location with appropriate stabilization to reduce erosion potential.

  This would avoid and minimize potential for impacts on water quality and stream structure and function by limiting crossing periods and the frequency of the crossings.

- ***Design Feature 19 (Canal and/or Ditch Crossings)***. Canal and/or ditch crossings would require placement of temporary bridges or improvement of existing crossings.

  This is intended to avoid or minimize damage to water-delivery infrastructure and/or interference with delivery of water.

- ***Design Feature 20 (Reduce Potential for Aquatic Invasive Species)***. Interagency-developed methods of avoidance, inspection, and sanitization as described in the *Operational Guidelines for Aquatic Invasive Species Prevention* and Equipment Cleaning (USFS 2009) would be adhered to. If control of fugitive dust near sensitive waterbodies is necessary, water would be obtained from treated municipal sources or drafted from sources known to contain no aquatic invasive species. Support vehicles, drill rigs, water trucks and drafting equipment would be inspected and sanitized, as needed, following interagency-approved operational guidelines.

  This would avoid, reduce, and/or minimize the potential for spread of aquatic invasive species through adherence with methods to prevent the transport of these invasive species during construction activities associated with the B2H Project.

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection, selective mitigation measures would be applied where feasible to reduce potential impacts on fish resources or where required to comply with law, regulation, or agency policy. For any alternative route selected, the Applicant would coordinate with the BLM, other land-managing agencies, or private landowners, as appropriate, to refine the implementation of mitigation for fish resources at specific locations. The selective mitigation measures that would be applied to fish resources are summarized below:

- ***Selective Mitigation Measure 1 (Limit Widening of Existing Roads in Areas of Sensitive Soils, Vegetation and/or Stream Crossing)***. In areas where soils, vegetation, and/or streams are sensitive to disturbance, existing roads are to be used for construction access and/or B2H Project maintenance will not, as much as possible/practicable, be widened or otherwise upgraded except in areas needed to make existing roads passable and safe.
- ***Selective Mitigation Measure 2 (Use Existing Access and/or Stream Crossing for Sensitive Resources Avoidance)***. Existing access and/or stream crossings would be used as

much as possible/practicable for construction and maintenance to avoid disturbance of sensitive resources crossed by the B2H Project. Minimizing ground-disturbing construction activities in the vicinity of fish-bearing streams would limit soil disturbance, thereby minimizing the potential for increased erosion and sedimentation. Where applied, this measure is expected to reduce impacts on fish resources by limiting disturbance associated with new access roads.

- ***Selective Mitigation Measure 4 (Minimize Slope Cut and Fill for Access and Work Areas)***. The alignment of new access roads will follow the landform contours where practicable to minimize ground disturbance or reduce scarring (visual contrast), or both, of the landscape. Modification to the size or configuration of the structure work areas, or both, facilitated by minor structure design adjustments (e.g., altering leg length) will be used to minimize cut and fill slopes and blend contours with existing topography. Additionally, soil amendments or mineral emulsions will be applied, or grading techniques, such as slope rounding and slope scarification, will be used to blend road and structure work area cuts into the landscape in areas of steep terrain where grading is necessary, in rocky areas, or where soil color would create strong landscape contrasts.

  Minimizing slope cut and fill reduces ground disturbance and potential habitat fragmentation. Water runoff is less likely to accelerate soil erosion, thus minimizing (1) potential damage from rutting and drilling, which, in turn, protects adjacent vegetation and (2) potential sedimentation into nearby fish-bearing streams.

- ***Selective Mitigation Measure 5 (Minimize Vegetation Clearing for Operational Clearances)***. Removal of vegetation in the right-of-way would be minimized to limit disturbance to timber resources, slow growing vegetation communities, and protect sensitive habitat, subject to structure- and conductor-clearance requirements. Trees and other vegetation would be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate. Minimizing vegetation clearing also reduces the potential for erosion and potential sedimentation in nearby fish-bearing streams.
- ***Selective Mitigation Measure 8 (Span and/or Avoid Sensitive Features)***. Within the limits of standard tower design, structures will be located to allow conductors to avoid identified sensitive features, such as dwellings/buildings and span sensitive existing land uses, natural features, hazardous substance remediation sites, and cultural resource sites. This could be accomplished through methods such as selective tower placement, spanning sensitive features, or realigning the B2H Project centerline (micro-siting).

  Flexibility in the placement of towers allows sensitive features to be avoided. Realigning the towers along an alternative route or realigning the alternative route (micro-siting), to the extent practicable, can result in avoiding or minimizing direct and indirect impacts on resources (e.g., fish-bearing streams), as well as land uses.

- ***Selective Mitigation Measure 12 (Seasonal and Spatial Fish and Wildlife Restrictions)***. To minimize disturbance to identified fish and wildlife species during sensitive periods, construction, operation, and maintenance activities would be restricted in designated areas unless exceptions

are granted by the Authorized Officer or his/her designated representative and other applicable regulatory agencies (e.g., USFWS, NMFS, state wildlife agencies).

Additional Conservation Measures for Fish and Associated Waterways

Additional measures that would be applied to reduce potential impacts on fish resources and associated waterways are outlined as follows:

Roadway/Stormwater Management

During the construction of access roads, BLM and USFS road construction standards and Oregon Department of Environmental Quality (DEQ) 1200-C permit stormwater and erosion control conservation measures and BMPs will be followed. These include, but are not limited to, the following:

- Road Location
  - Locate temporary and permanent roads and landings on stable locations, e.g., ridge tops, stable benches or flats, and gentle-to-moderate side slopes. Minimize construction on steep slopes, slide areas and high landslide hazard locations.
  - Locate temporary and permanent road construction or improvement to minimize the number of stream crossings.
  - Avoid locating roads and landings in wetlands, RCAs, floodplains and waters of the state. Avoid locating landings in areas that can contribute to dry draws and swales.
  - Locate roads and landings to minimize total transportation system mileage. Renovate or improve existing roads or landings when it would cause less adverse environmental impact. Where roads traverse land in another ownership, investigate options for using those roads before constructing new roads.
- Road Design
  - Design road cut and fill slopes with stable angles, to minimize erosion and prevent slope failure.
  - Construct road fills to prevent fill failure using inorganic material, compaction, buttressing, subsurface drainage, rock facing or other effective means.
  - Design roads crossing low-lying areas so that water does not pond on the upslope side of the road. Provide cross drains at short intervals to ensure free drainage.
- Waterway Crossing
  - Waterways that support ESA-listed fish, or designated as critical habitat, or both will be completely spanned
  - For fish-bearing waterways that do not support ESA-listed fish or waterways that are not designated as critical habitat, use no-fill structures (e.g., portable mats, temporary bridges, or improved hardened crossings) for temporary stream crossings when practicable. When not practicable, design temporary stream crossings with the least amount of fill and construct with coarse material to facilitate removal upon completion (See Design Feature 18).

- Stormwater/Drainage
  - Install underdrain structures when roads cross or expose springs, seeps, or wet areas rather than allowing intercepted water to flow down gradient in ditch lines.
  - Effectively drain the road surface by using crowning, insloping or outsloping, grade reversals (rolling dips) and waterbars or a combination of these methods. Avoid concentrated discharge onto fill slopes unless the fill slopes are stable and erosion proofed.
  - Outslope temporary and permanent low volume roads to provide surface drainage on road gradients up to 6 percent unless there is a traffic hazard from the road shape.
  - Consider using broad-based drainage dips and/or leadoff ditches in lieu of cross drains for low volume roads. Locate these surface water drainage measures where they will not drain into wetlands, floodplains and waters of the state.
  - Avoid use of outside road berms unless designed to protect road fills. If road berms are used, breach to accommodate drainage where fill slopes are stable. A road berm will be used within an RCA only if the berm helps to avoid or minimize impacts on fish habitat.
  - Divert road and landing runoff water away from headwalls, slide areas, high landslide hazard locations or steep erodible fill slopes.
  - Design landings to disperse surface water to vegetated stable areas.
  - Disconnect road runoff to stream channels by outsloping the road approach. If outsloping is not possible, use runoff control, erosion control and sediment containment measures. These may include using additional cross drain culverts, ditch lining, and catchment basins. Minimize ditch flow conveyance to stream through cross drain placement above stream crossing.
  - Locate cross drains to prevent or minimize runoff and sediment conveyance to wetlands, RCAs, floodplains and waters of the state. Implement sediment reduction techniques such as settling basins, brush filters, sediment fences and check dams to prevent or minimize sediment conveyance.
- Sediment/Erosion Control
  - Locate waste disposal areas outside wetlands, RCAs, floodplains and unstable areas to minimize risk of sediment delivery to waters of the state. Apply surface erosion control prior to the wet season. Prevent overloading areas which may become unstable.
  - Phase clearing and grading to the maximum extent practicable to prevent exposed inactive areas from becoming sources of erosion.
  - Preserve existing vegetation and revegetate open areas when practical.
  - Use temporary sediment control measures (e.g., check dams, silt fencing, bark bags, filter strips and mulch) to slow runoff and contain sediment from road construction areas. Remove any accumulated sediment and the control measures when work or haul is complete. When long-term structural sediment control measures are incorporated, remove any accumulated sediment to retain capacity of the control measure.

- Limit road and landing construction, reconstruction, or renovation activities to the dry season. Ensure erosion control measures are properly functioning and that additional erosion control measures are on site to allow for immediate storm-proofing if necessary.
- Apply native seed and certified weed free mulch to cut and fill slopes, ditch lines, and waste disposal sites with the potential for sediment delivery to wetlands, RCAs, floodplains and waters of the state. Apply upon completion of construction and as early as possible to increase germination and growth. Reseed if necessary to accomplish erosion control. Select seed species that are fast growing, and provide ample ground cover and soil-binding properties. Apply mulch that will stay in place and at site-specific rates to prevent erosion.
- Place sediment-trapping materials or structures such as straw bales, jute netting, or sediment basins at the base of newly constructed fill or side slopes where sediment could be transported to waters of the state. Keep materials away from culvert outlets.
- Use biotechnical stabilization and soil bioengineering techniques to control bank erosion (e.g., commercially produced matting and blankets, native live plants or cuttings, dead plant material, rock, or other inert structure).
- Suspend ground-disturbing activity if projected/forecasted rain will saturate soils to the extent that there is potential for movement of sediment from the road to wetlands, floodplains, or waters of the state (See Design Feature 17). Cover or temporarily stabilize exposed soils during work suspension. Upon completion of ground-disturbing activities, immediately stabilize fill material over stream crossing structures. Measures could include but not be limited to erosion control blankets and mats, soil binders, soil tackifiers, or slash placement.
- Wind Erosion/Dust Control – apply water as needed to avoid wind-blown soil.
- When conducting erosion control measures, apply fertilizer in a manner to prevent direct fertilizer entry to wetlands, RCAs, floodplains, or waters of the state.
- Stormproof open resource roads receiving infrequent maintenance to reduce road erosion and reduce the risk of washouts by concentrated water flows. Stormproof temporary roads if retained overwinter.
- At the end of each workday soil stockpiles must be stabilized or covered, or other BMPs must be implemented to prevent discharges to surface waters or conveyance systems leading to surface waters.
- Suspend storm proofing/decommissioning operations and cover or otherwise temporarily stabilize all exposed soil if conditions develop that cause a potential for sediment-laden runoff to enter a wetland, floodplain or waters of the state. Resume operations when conditions allow turbidity standards to be met.
- Remove snow on haul roads in a manner that will protect roads and adjacent resources. Retain a minimum layer (2 to 4 inches) of compacted snow on the road surface. Provide drainage through the snow bank at periodic intervals to allow for snow melt to drain off the road surface.
- Maintain road surface by applying appropriate gradation of aggregate and suitable particle hardness to protect road surfaces from rutting and erosion under active haul activities where runoff drains to wetlands, RCAs, floodplains, or waters of the state.

- BMP Maintenance
  - Establish and promptly implement procedures for maintenance and repair of erosion and sediment control measures.

Staging

- Establish staging areas for storage of vehicles, equipment, and fuels to minimize erosion into or contamination of streams and floodplains.
- Place staging areas 300 feet or more from any natural waterbody or wetland in areas where topography does not restrict such a distance unless Project Engineer determines that topographic restrictions or other site characteristics necessitate the placement of a staging site use closer to the edge of a natural waterbody/wetland.
- For staging areas closer than 300 feet to the edge of a natural waterbody/wetland, sediment and pollution control measures will be put in place before and during staging activities to protect the natural waterbody/wetland. Staging areas closer than 300 feet will be approved by agency biologist before staging occurs.

Solid Waste and Hazardous Materials Management

- Implement the following BMPs when applicable:
  - written spill prevention and response procedures
  - employee training on spill prevention and proper disposal procedures
  - spill kits in all vehicles
  - regular maintenance schedule for vehicles and machinery
  - material delivery and storage controls, training and signage, and covered storage areas for waste and supplies
  - hazardous materials will be stored per state law guidelines (e.g., secondary containment)

Heavy Equipment Use

- Choice of equipment—Heavy equipment will be commensurate with the Project and will be operated in a manner that minimizes adverse effects on the environment (e.g., minimally sized, low-pressure tires, minimal hard turn paths for tracked vehicles, and temporary mats or plates within wet areas or sensitive soils)
- The fueling, cleaning and inspection for petroleum products and invasive weeds will be implemented as follows:
  - Store and fuel equipment in staging areas after daily use.
  - Inspect daily for fluid leaks before leaving the vehicle staging area for operation.

Concrete

- No uncured concrete or form materials will be allowed to enter active stream channels.

Blasting

The following conservation measures/BMPs for blasting will be incorporated into a Project-specific blasting plan that meets all state and federal requirements. No in-water blasting will occur as part of the Project.

- No implosive splicing or subsurface blasting will occur within 300 feet of a perennial waterway or waterway that supports ESA-listed fish or designated critical habitat.
- Subsurface blasting activities will adhere to guidelines similar and/or identical to those set forth in the Endangered Species Act Section 7(a)(2) Formal Consultation for the Sawtooth National Forest's Programmatic Road Maintenance Activities; Upper Salmon River Subbasin HUC 17060201; Custer and Blaine Counties, Idaho (NMFS 2013a) or as determined during this consultation.
  - Table 3-197 shows the proposed minimum setback distances from the habitat of ESA-listed fish for blasting activities.

Table 3-197. Relationship Between Explosive Charge Weight in Substrates and Required Minimum Setback Distances (Feet) from A Waterbody Occupied or Potentially Occupied by ESA-Listed Fish to Avoid Adverse Effects

Substrate	Explosive Charge Weight in Pounds								
	0.5	1	2	5	10	25	100	500	1,000
	Minimum Setback Distances (feet)								
Rock	30	50	80	120	170	270	530	1,180	1,670
Frozen Material	40	50	70	110	160	250	500	1,120	1,580
Stiff Clay, Gravel, Ice	30	40	60	100	140	220	440	990	1,400
Clay Silt, Dense Sand	30	40	50	80	120	180	370	820	1,160
Medium to Dense Sand	20	30	50	70	100	160	320	720	1,020
Medium Organic Clay-Spawning/Rearing	15	20	30	50	70	100	210	460	660
Medium Organic Clay- Incubation	19	27	38	60	85	135	270	600	850
Soft Organic Clay-Spawning/Rearing	15	20	30	40	60	100	190	440	620
Soft Organic Clay- Incubation	19	27	38	60	85	135	270	600	850

Table Note: Described combinations of charge weight and setbacks, by substrate, will produce up to 2 pounds per square inch (psi) hydrostatic overpressure on the swim bladder of fish, or 0.5 inches per second (ips) vibration velocity. Both values are the known thresholds for adverse effects on individual fish (hydrostatic overpressure) and for incubating eggs (vibration velocity) (NMFS 2013a).

- Blasting within the setback distances identified in Table 3-197 will occur within the in-water work windows identified in Table 3-198 as much as practicable. Table 3-198 presents the seasonal restrictions based on Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources (ODFW 2008) for waterways that are crossed/paralleled by the Project and support ESA-listed fish or critical habitat, or both.

Table 3-198. Seasonal Restrictions for Waterways Crossed/Paralleled by the B2H Project and that Support ESA-Listed Fish and/or Critical Habitat

Waterway	In-Water Work Period[1]
Bear Creek	July 1 to October 31
West Birch Creek	July 1 to October 31
California Gulch	July 1 to October 31
East Birch Creek	July 1 to October 31
Dry Creek	July 1 to October 15
Grande Ronde River	July 1 to October 15
Rock Creek	July 1 to October 15
Sheep Creek	July 1 to October 15
Mill Creek	July 1 to October 15
Ladd Creek	July 1 to October 15

Table Note: Oregon guidelines for in-water work are outlined because all the streams that are crossed by the Project which support ESA-listed fish that fall under the jurisdiction of the NOAA Fisheries are located in Oregon.

- Occurrences in which blasting is necessary outside the in-water work window and within the setback distances provided in Table 3-197 are anticipated to be rare and only to occur under unavoidable circumstances.
  - If blasting is anticipated to exceed protective guidelines, NOAA Fisheries and ODFW will be contacted, and selective mitigation measures will be developed as necessary. Mitigation measures may include ensuring fish are not in the stream near the blasting site and/or in-water monitoring for pressure changes resulting from blasting.
- Additional conservation measures/BMPS that will be incorporated into the Project-specific blasting plan for implementation are as follows:
- Use controlled blasting techniques to minimize loss of material on steep slopes or into wetlands, RCAs, floodplains and waters of the state.
  - Waste material will not be side cast within RCAs.
  - Waste material will be loaded and hauled to appropriate disposal locations.
- Non-explosive or micro-explosive alternatives, such as Betonamit® or an equivalent, will be used where possible to reduce resource impacts.
- All shots should be fired in pre-drilled or dug holes that are small in diameter, shallow, and properly stemmed or back-filled.
- Place sandbags or other fill over loaded holes, over each shot to increase stemming.
- All holes will be individually primed with electric blasting cap or NONEL blasting cap.
- In multiple hole shots:
  - No two-holes side by side will be fired simultaneously.
  - Blasting caps with millisecond delay will be used.
  - At least 50 milliseconds of delay will be used.

- Do not exceed a powder factor of one-half pound of explosives per cubic yard of solid rock. Do not exceed ¼ pound per cubic yard of explosive when air gapping boulders.

Herbicides

- Chemical control of vegetation or noxious weeds will use BLM- or USFS-approved herbicides on all federally, state, or privately owned lands. Table 3-199 lists all herbicides approved for Project use and the lands allowing their use.

Table 3-199. Herbicides Approved for B2H Project Use By Jurisdiction

Herbicide	Bureau of Land Management	U.S. Forest Service	All Others
2,4-D	✓		✓
Aminopyralid	✓		✓
Chlorsulfuron	✓	✓	✓
Clopyralid	✓	✓	✓
Dicamba	✓		✓
Diflufenzopyr + Dicamba	✓		✓
Fluridone	✓		✓
Fluroxypyr	✓		✓
Glyphosate	✓	✓	✓
Hexazinone	✓		✓
Imazapic	✓	✓	✓
Imazapyr	✓	✓	✓
Metsulfuron Methyl	✓	✓	✓
Picloram	✓	✓	✓
Rimsulfuron	✓		✓
Sethoxydim		✓	✓
Sulfometuron Methyl	✓	✓	✓
Triclopyr	✓	✓	✓

The following conservation measures/BMPS for herbicide use are similar and/or identical to those outlined in ARBO II (NMFS 2013b), and will be incorporated into a Project-specific herbicide plan that meets state and federal requirements:

- General Guidance
  - Use herbicides only in an integrated weed or vegetation management context where all treatments are considered and various methods are used individually or in concert to maximize the benefits while reducing the undesirable effects.
  - Carefully consider herbicide impacts on fish, wildlife, non-target native plants, and other resources when making herbicide choices.
  - Treat only the minimum area necessary for effective control. Herbicides may be applied by selective, hand-held, backpack, or broadcast equipment in accordance with state and federal law and only by certified and licensed applicators to specifically target invasive plant species.
  - Herbicide application rates will follow label directions, unless site-specific analysis determines a lower maximum rate is needed to reduce non-target impacts.

  - An herbicide safety/spill response plan is required for all projects to reduce the likelihood of spills, misapplication, reduce potential for unsafe practices, and to take remedial actions in the event of spills. Spill plan contents will follow agency direction.
  - Pesticide applicator report must be completed within 24 hours of application.

- Herbicide Adjuvants – When recommended by the label, an approved aquatic surfactant will be used to improve uptake. The surfactants R-11, Polyethoxylated tallow amine (POEA), and herbicides that contain POEA (e.g., Roundup) will not be used.
- Herbicide Carriers – Herbicide carriers (solvents) are limited to water or specifically labeled vegetable oil.
- Herbicide Mixing – Herbicides will be mixed more than 150 feet from any natural waterbody to minimize the risk of such an accidental discharge. Impervious material will be placed beneath mixing areas in such a manner as to contain any spills associated with mixing/refilling. Spray tanks shall be washed further than 300 feet away from surface water. All hauling and application equipment shall be free from leaks and operating as intended.
- Herbicide Application Methods – Liquid forms of herbicides will be applied as follows:
  - Broadcast spraying using booms mounted on ground-based vehicles (this consultation does not include aerial applications.)
  - Spot spraying with hand held nozzles attached to back pack tanks or vehicles and hand-pumped sprayers to apply herbicide directly onto small patches or individual plants.
  - Hand/selective through wicking and wiping, basal bark, frill (“hack and squirt”), stem injection, or cut-stump.
  - Dyes or colorants, (e.g., Hi-Lite, Dynamark) will be used to assist in treatment assurance and minimize over-spraying within 100 feet of live water.
- Aerial spraying will not occur as part of the Project.
- Minimization of Herbicide Drift and Leaching – Herbicide drift and leaving will be minimized as follows:
  - Do not spray when wind speeds exceed 10 miles per hour to reduce the likelihood of spray/dust drift. Winds of 2 miles per hour or less are indicative of air inversions. The applicator must confirm the absence of an inversion before proceeding with the application whenever the wind speed is 2 miles per hour or less.
  - Be aware of wind directions and potential for herbicides to affect aquatic habitat area downwind.
  - Keep boom or spray as low as possible to reduce wind effects.
  - Avoid or minimize drift by utilizing appropriate equipment and settings (e.g., nozzle selection, adjusting pressure, drift reduction agents, etc.) Select proper application equipment (e.g., spray equipment that produces 200-800 micron diameter droplets [Spray droplets of 100 microns or less are most prone to drift]).
  - Follow herbicide label directions for maximum daytime temperature permitted (some types of herbicide volatilize in hot temperatures).

- Do not spray during periods of adverse weather conditions (snow or rain imminent, fog, etc.) Wind and other weather data will be monitored and reported for all pesticide applicator reports.
- Herbicides shall not be applied when the soil is saturated or when a precipitation event likely to produce direct runoff to fish-bearing waters from a treated site is forecasted by NOAA National Weather Service or other similar forecasting service within 48 hours following application. Soil-activated herbicides can be applied as long as label is followed. Do not conduct any applications during periods of heavy rainfall.

- Herbicide buffer distances – The following no-application buffers – which are measured in feet and are based on herbicide formula, stream type, and application – will be observed during herbicide applications (Table 3-200). Herbicide applications based on a combination of approved herbicides will use the most conservative buffer for any herbicide included. Buffer widths are measured as map distance perpendicular to the bankfull for streams, the upland boundary for wetlands, or the upper bank for roadside ditches.

Table 3-200. No-Application Buffer Widths for Herbicide Application, by Stream Types and Application Methods

Herbicides	Perennial Streams and Wetlands and Intermittent Streams and Roadside Ditches with Flowing or Standing Water Present			Dry Intermittent Streams, Dry Intermittent Wetlands, and Dry Roadside Ditches		
	Broadcast Spraying	Spot Spraying	Hand Selective	Broadcast Spraying	Spot Spraying	Hand Selective
Labeled for Aquatic Use						
Aquatic Glyphosate	100	waterline	waterline	50	0	0
Aquatic Imazapyr	100	waterline	waterline	50	0	0
Aquatic Triclopyr-TEA	not allowed	15	waterline	not allowed	0	0
Aquatic 2,4-D (amine)	100	waterline	waterline	50	0	0
Low Risk to Aquatic Organisms						
Aminopyralid	100	waterline	waterline	50	0	0
Dicamba	100	15	15	50	0	0
Dicamba+diflufenzopyr	100	12	12	50	0	0
Imazapic	100	15	bankfull elevation	50	0	0
Clopyralid	100	15	bankfull elevation	50	0	0
Metsulfuron-methyl	100	15	bankfull elevation	50	0	0
Moderate Risk to Aquatic Organisms						
Imazapyr	100	50	bankfull elevation	50	15	bankfull elevation
Sulfometuron-methyl	100	50	5	50	15	bankfull elevation
Chlorsulfuron	100	50	bankfull elevation	50	15	bankfull elevation

Table 3-200. No-Application Buffer Widths for Herbicide Application, by Stream Types and Application Methods

Herbicides	Perennial Streams and Wetlands and Intermittent Streams and Roadside Ditches with Flowing or Standing Water Present			Dry Intermittent Streams, Dry Intermittent Wetlands, and Dry Roadside Ditches		
	Broadcast Spraying	Spot Spraying	Hand Selective	Broadcast Spraying	Spot Spraying	Hand Selective
High Risk to Aquatic Organisms						
Triclopyr-BEE	Not Allowed	150	150	not allowed	150	150
Picloram	100	50	50	100	50	50
Sethoxydim	100	50	50	100	50	50
2,4-D (ester)	100	50	50	100	50	50

Table Source: ARBO II (NMFS 2013b)

- Not included in the table are Fluridone, Fluroxypyr, Hexazinone, and Rimsulfuron.
  - Fluridone is an aquatic herbicide. Herbicides will not be used in-water (aquatic plants will not be removed) as part of the Project. Therefore, Fluridone will not be used within watersheds that support ESA-listed fish or critical habitat.
  - Registered use of Fluroxypyr, Hexazinone, and Rimsulfuron is not appropriate in riparian and aquatic habitats, they are only approved for terrestrial habitats. Therefore, these three herbicides will not be used within 300 feet of a waterway regardless of application method.
- The following will not occur as part of the Project:
  - Herbicides will not be used in-water (aquatic plants will not be removed)
  - Aerial spraying will not occur

Drilling (Geotechnical Investigations)

- Drilling will not occur within waterways or RCAs
- Water used for drilling will be procured from existing municipal sources
- Drill recovery/recycling pits, and any associated waste or spoils will be completely isolated from surface waters, off-channel habitats, and wetlands.
- All waste or spoils will be covered if precipitation is falling or imminent.
- All drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, will be contained and then completely recovered and recycled or disposed of as necessary to prevent entry into any waterway.
  - Note - It is anticipated that only a minor amount of water will be used during drilling because the bore holes are anticipated to be shallow. At this scale, the drilling fluids are minimal and generally absorbed by soil to create a cake around the drill hole. A minor amount of water sometimes occurs at the surface but there is generally not enough to collect.

- If a drill boring case breaks and drilling fluid or waste is visible in water or a wetland, make all possible efforts to contain the waste and contact ODFW and NMFS/USFWS within 48 hours.

Residual Impacts

Residual impacts are the impacts on resources anticipated to occur from B2H Project activities after the application of selective mitigation measures described in the Mitigation Planning and Effectiveness section. The application of selective mitigation measures is anticipated to reduce the level of residual impacts associated with B2H Project construction and maintenance from the initial levels. The level of anticipated residual impacts on fish resources was assessed using the criteria presented in Table 3-196. Table 3-201 summarizes the level of anticipated initial and residual impacts on fish resources, as well as the relevant design features and selective mitigation measures.

Table 3-201. Summary of Initial Impacts and Residual Impact Levels for Fish Resources

Resource	Design Features of the B2H Project for Environmental Protection	Initial Impact	Selective Mitigation Measure	Residual Impact
Bull trout critical habitat	1, 2, 4, 5, 9, 15, 16, 17, 18, 19, 20	High	1, 2, 4, 5, 8, 12	Moderate
Snake river spring/summer-run Chinook critical habitat	1, 2, 4, 5, 9, 15, 16, 17, 18, 19, 20	High	1, 2, 4, 5, 8, 12	Moderate
Middle Columbia River steelhead critical habitat	1, 2, 4, 5, 9, 15, 16, 17, 18, 19, 20	High	1, 2, 4, 5, 8, 12	Moderate
Snake River steelhead critical habitat	1, 2, 4, 5, 9, 15, 16, 17, 18, 19, 20	High	1, 2, 4, 5, 8, 12	Moderate
Redband trout occupied streams	1, 2, 4, 5, 9, 15, 16, 17, 18, 19, 20	Moderate	1, 2, 4, 5, 8, 12	Low
Coho essential fish habitat	1, 2, 4, 5, 9, 15, 16, 17, 18, 19, 20	High	1, 2, 4, 5, 8, 12	Moderate
Chinook essential fish habitat	1, 2, 4, 5, 9, 15, 16, 17, 18, 19, 20	High	1, 2, 4, 5, 8, 12	Moderate

Additional Analysis

In addition to the assessment of residual impacts on fish resources, the extent of disturbance to fish resources was estimated based on the B2H Project description. Prior to final engineering design, the location of B2H Project features such as new access roads, upgrades to existing roads, overland access, transmission line structures, or other B2H Project facilities, are not identified. The total extent of disturbance (in acres) due to construction of features such as the access network (construction of new roads, upgrades to existing roads, overland access travel), transmission line structures, and other B2H Project facilities was estimated over the entire length of an alternative route using the access model developed for the B2H Project and the Applicant's B2H Project description (refer to Chapter 2). Disturbance associated with the construction of the B2H Project was assumed to occur at a constant density per mile of transmission line, and was calculated for each alternative route based on the total estimated disturbance and total length of each alternative route. The estimated density of disturbance (in acres per mile) for each alternative route was used to calculate the extent of disturbance on vegetation communities (in acres) in RCAs with fish resources crossed by an alternative route.

B2H Project impacts on water resources were considered using revised geospatial mapping data compiled from several different sources and a visual review with updated aerial imagery. The specific datasets and compilation methods are described in greater detail in Section 3.2.5.4.

This information guided qualitative discussions assessing B2H Project impacts on fish resources using the criteria presented in Table 3-196.

3.2.5.5 AFFECTED ENVIRONMENT

The B2H Project crosses eleven 4th-level HUC subbasins which are considered to have either anadromous or resident fish populations. General effects on fish are discussed at the subbasin level (4th level HUC); effects on special status fish, EFH and critical habitat are discussed at the subwatershed level (6th level HUC). The following subbasins are crossed by the proposed B2H Project:

- Middle Columbia-Lake Wallula subbasin (HUC 17070101 in the in the Middle Columbia River Basin)
- Willow subbasin (HUC 17070104 in the Middle Columbia River Basin)
- Umatilla subbasin (HUC 17070103, Middle Columbia River Basin)
- Upper Grande Ronde subbasin (HUC 17060104, Lower Snake River Basin)
- Powder subbasin (HUC 17050203, Middle Snake River Basin)
- Burnt subbasin (HUC 17050202, Middle Snake River Basin)
- Brownlee Reservoir subbasin (HUC 17050201, Middle Snake River Basin)
- Willow subbasin (HUC 17050119, Middle Snake River Basin)
- Lower Malheur subbasin (HUC 17050117, Middle Snake River Basin)
- Lower Owyhee subbasin (HUC 17050110, Middle Snake River Basin)
- Middle Snake-Succor subbasin (HUC 17050103 in the Middle Snake River Basin)

The six B2H segments roughly correspond with hydrologic basin boundaries in the B2H Project area.

The fish species and habitat in the study corridor are primarily coldwater resident and anadromous species; however some areas do support native warm-water fish species. Many of the species of major interest provide important commercial, tribal, and recreational fishery resources in the northwest. Fish habitat quality varies by location, orientation, geographic land form, vegetation, and past and current land uses. Shoreline/bank vegetation, particularly large trees in the riparian areas, helps moderate temperature and supply input of organic debris in the form of leaves, terrestrial insects, and large woody debris.

ANADROMOUS FISH

Anadromous fish spawn in freshwater, rear for varied periods, and then migrate as juveniles to the ocean before returning as adults to freshwater streams, rivers, and lakes to spawn. Three species of anadromous salmonids are present in the study corridor, including Chinook salmon, coho salmon, and steelhead. Varied races of these species are assumed to be in the study corridor, including Snake River spring/summer-run Chinook salmon, Middle Columbia River summer steelhead and Snake River

Basin summer steelhead, depending on the river system. Pacific lamprey also may be present within the study corridor.

RESIDENT FISH

Resident fish complete their life cycle entirely in the freshwater system. The native subspecies of rainbow trout (*O. mykiss*) is known within the study corridor as inland Columbia Basin redband trout. Bull trout, a native char species, also is present in part of the B2H Project area. Mountain whitefish (*Prosopium williamsoni*) is another native salmonid present in cold water systems and may be present in some of larger cold water systems in the B2H Project area. Other common fish species present in many of the streams in the study corridor include suckers (*Catostomus* spp.), northern pikeminnow (*Ptychocheilus oregonensis*), peamouth (*Mylocheilus caurinus*), redside shiner (*Richardsonius balteatus*), daces (*Rhinichthys* spp.), and sculpins (*Cottus* spp.)

SPECIAL STATUS FISH

Special status species addressed in this section include fish species that are:

- Listed as threatened or endangered, proposed for listing, or identified as a candidate for listing by the USFWS or NOAA Fisheries under the Federal ESA.
- Listed as threatened or endangered, proposed for listing, or identified as a candidate for listing by the Oregon under the Oregon ESA of 1987 (Sections 496.171–496.170).
- Listed by the BLM or USFS as a sensitive species or a USFS MIS.
- Listed as a species of concern by the USFWS or NOAA Fisheries under the Federal ESA, or as a sensitive species by Oregon.
- Listed as a commercial salmon species under the MSA.

Based on an assessment of known species distributions and habitats in the study corridor, 10 special status species, including four ESA-listed as threatened fish species, (as well as associated critical habitat) have the potential to occur in the study corridor. The ESA-listed fish that have the potential to occur in the B2H Project area include:

- Middle Columbia River Distinct Population Segment (DPS) steelhead
- Snake River Basin DPS steelhead
- Snake River Evolutionarily Significant Unit (ESU) spring/summer-run Chinook salmon
- Columbia River DPS bull trout

Fall-run Chinook salmon occurs in the Snake River Basin, however neither the Applicant's Proposed Action Alternative nor any of the alternative routes crosses any streams with suitable habitat or designated critical habitat for this species. Special status fish species in the B2H Project area are listed in Table 3-202 and are briefly summarized below.

Table 3-202. Special Status and Management Indicator Fish Species in the Study Corridor

Common Name	Scientific Name	Relevant Laws, Regulations, and Policies	Federal and State Status	Habitat Status
Middle Columbia River steelhead[1]	*Oncorhynchus mykiss*	ESA, CH, BLM, USFS, MIS, ODFW	F (T), S (C)	CH (PCEs for spawning, rearing, migration), ESH (all habitat types)
Snake River Basin steelhead[1,2]	*Oncorhynchus mykiss*	ESA, CH, BLM, USFS, MIS, ODFW	F (T), S (V)	CH (PCEs for spawning, rearing, migration), ESH (all habitat types)
Snake River Chinook spring/summer-run	*Oncorhynchus tshawytscha*	ESA, CH, MSA-EFH, BLM, USFS, ODFW	F (T), O (T)	EFH (rearing, migration), ESH (all habitat types)
Bull trout	*Salvelinus confluentus*	ESA, CH, BLM, USFS, ODFW	F (T), S (C)	CH (PCE for migration)
Coho salmon	*Oncorhynchus kisutch*	MSA-EFH	Not applicable	EFH (rearing, migration), ESH (all habitat types)
Redband trout	*Oncorhynchus mykiss gairdneri*	SOC, BLM, USFS, MIS, ODFW	S (V)	Not applicable
Rainbow trout	*Oncorhynchus mykiss*	MIS	Not applicable	Not applicable
Pacific lamprey	*Entosphenus tridentatus*	SOC, ODFW; USFS	F (SOC), S (V)	Not applicable
Western brook lamprey	*Lampetra richardsoni*	ODFW	S (V)	Not applicable

Table Notes:

[1]Only summer-run occurs within the study corridor.

[2]This information is based on modeling of potential habitat for Snake River Basin steelhead in Segment 3. Steelhead do not currently occupy any of the Powder River subbasin or other areas in Segment 3. This subspecies was historically sympatric with redband trout in these tributary areas of the Snake River, but the anadromous life history form was extirpated by construction of the Hells Canyon Dam Complex.

BLM = Bureau of Land Management

CH = critical habitat

EFH = Essential Fish Habitat

ESA =Endangered Species Act

F (T) = federally threatened

MIS = management indicator species

MSA = Magnuson-Stevens Act

ODFW = Oregon Department of Fish and Wildlife

PCE = primary constituent element

S (C)= critical sensitive species

S (V) = vulnerable sensitive species

SOC = species of concern

USFS = U.S. Forest Service

FISH SPECIES DESCRIPTION AND STATUS

Umatilla River Subbasin (Segment 1)

Middle Columbia River Summer Steelhead (*Oncorhynchus mykiss*)

The Middle Columbia River (MCR) steelhead DPS was first listed as threatened under the ESA on March 25, 1999 (64 FR 14517). After a status review by NOAA Fisheries, the DPS was again listed as threatened on January 5, 2006 (71 FR 834) and updated (no change in status occurred) on April 14, 2014 (79 FR 20802). Critical habitat encompasses all river reaches, including estuarine areas, adjacent riparian zones, and tributaries within the range of this DPS as designated on September 2, 2005 (70 FR 52630).

This DPS includes all naturally spawned steelhead populations below natural and artificial impassable barriers in streams from above the Wind River, Washington, and the Hood River, Oregon (exclusive), upstream to and including the Yakima River, Washington, and progeny of seven artificial propagation programs. This DPS excludes steelhead from the Snake River Basin (NMFS 2016a).

Currently, 17 extant populations occur within this DPS. The populations fall into four major population groups (NMFS 2014):

- Yakima River Basin (four extant populations)
- Umatilla/Walla Walla drainages (three extant and one extirpated populations)
- John Day River drainage (five extant populations)
- Cascades Eastern Slope Tributaries (five extant and two extirpated populations)

Of the four major population groups, the Umatilla/Walla Walla drainages group falls within the B2H Project area.

MCR summer steelhead adults return to the Columbia River from March through October after having spent from one to three years in the ocean. Adults spawn from January to June in the year following their entry into freshwater. Juvenile summer steelhead will smolt and migrate to the ocean in May and June. Most wild summer steelhead migrate to the ocean at age 2, while most hatchery smolts migrate at age 1. In contrast, winter steelhead return to the Columbia River from November through April after having spent two years in the ocean. Adults spawn from December through June. Juvenile winter steelhead smolt and migrate to the ocean in May and June. Wild winter steelhead juveniles spend two or three years rearing in freshwater, while hatchery juveniles spend only one year rearing in freshwater (Northwest Power and Conservation Council [NPCC] 2004a).

MCR summer steelhead are found in the Umatilla River subbasin and occasionally in the Willow Creek subbasin. Umatilla River origin summer steelhead adults typically enter the Columbia River from the Pacific Ocean in June through August of the year before spawning. Entry into the Umatilla River begins in August, peaks in March and is mostly complete by May 1 (NPCC 2004a). Spawning in the Umatilla River and tributary streams usually occurs from mid-February to early June with peak spawning in early to mid-April. Juvenile steelhead emerge from redds in late April through early July, and most rear

through two winter seasons before migrating as smolts from the Umatilla River into the Columbia River (NPCC 2004a).

Current major production areas of MCR summer steelhead in the Umatilla subbasin include Birch Creek and its tributaries, and Meacham Creek and its tributaries. Historically, Butter Creek and McKay Creek upstream of McKay Reservoir also may have supported MCR steelhead populations. Adult steelhead also are occasionally found in Willow Creek, and a population of resident redband trout is found there. Willow Creek and its tributaries may have historically had a population of steelhead (NPCC 2004a).

The B2H Project would cross the several waterways which support MCR steelhead in the Umatilla subbasin. Critical habitat for MCR steelhead is designated in the areas of these streams that would be crossed by the Project route (MV-11).

Chinook Salmon (*Oncorhynchus tshawytscha*)

The following information is excerpted from the NPCC subbasin plan for the Umatilla River/Willow Creek subbasin (NPCC 2004a). The endemic spring Chinook population went extinct in the Umatilla/Willow subbasin in the early 1900s. In 1986, spring Chinook salmon were re-introduced into the subbasin. These fish were from Carson Hatchery stock which is a mixture of upriver spring Chinook races that spawn above Bonneville Dam. This stock enters the Columbia River from the ocean from February through April. Entry into the Umatilla River begins in late March, peaks in May, and is mostly complete by the end of June (NPCC 2004a). The majority (approximately 75 percent) of A-run enters the Umatilla River in May. Little is known of historical spring Chinook salmon distribution in the Umatilla River subbasin. However, oral testimony from tribal members and immigrants indicates that the North Fork Umatilla, McKay Creek above the reservoir, and the North Fork of Meacham Creek once had harvestable levels of spring Chinook salmon (NPCC 2004a). In addition, spawning occurred in the mainstem from the forks (RM 89.5) to the confluence of McKay Creek (RM 50.5) and in McKay, Birch, and Butter creeks (NPCC 2004a). Spring Chinook salmon may currently utilize the lower reach of Birch Creek for rearing and migration (MV-11). A portion of Lower Birch Creek is designated as EFH for Chinook salmon; however, this portion of the creek is outside of the effects analysis for the B2H Project. The Umatilla River within the analysis area is designated as EFH for Chinook salmon.

Coho Salmon (*Oncorhynchus kisutch*)

The following information is excerpted from the NPCC subbasin plan for the Umatilla River/Willow Creek subbasin (NPCC 2004a). As with Chinook salmon, coho went extinct in the Umatilla/Willow subbasin early in the twentieth century. From 1966 to 1969 and then starting again in 1987 hatchery reared coho smolts have been introduced into the Umatilla River. These smolts are from Tanner Creek (lower Columbia River) stock. Adult coho salmon returning to the Umatilla River typically enter the river from mid-September through mid-December (Contor et al. 1997; NPCC 2004a). Most returns are adults but three year olds (jacks) are common and have averaged about 9 percent of the total returns since 1988. Spawning has been observed in late October and throughout November and December with a few observations made in January (NPCC 2004a).

Coho emerge from the gravel in February, March or April depending on the location of the redds in the winter and the associated water temperature and spawn time. Most juvenile coho rear one summer and one winter in the Umatilla before migrating to the Columbia River in April and May. The current distribution of coho salmon is limited to the Umatilla River subbasin; coho are not found in the Willow Creek subbasin (NPCC 2004a). According to StreamNet data, the mainstem Umatilla River within the analysis area and the mainstem of Birch Creek downstream of Pilot Rock is currently utilized by coho salmon for spawning and rearing (StreamNet 2016). Amendment 18 of the Pacific Coast Salmon Plan (PFMC and NMFS 2014) designated EFH under the MSA for coho salmon within portions of the Umatilla River and Birch Creek, including within the analysis area (MV-11).

Upper Grande Ronde River Subbasin (Segments 1 and 2)

Snake River Basin Steelhead (*Oncorhynchus mykiss*)

The SRB steelhead DPS was first listed as threatened on August 18, 1997 (62 FR 43937). After a status review, the DPS was reaffirmed as threatened on January 5, 2006 (71 FR 834) and again updated (no change in status occurred) on April 14, 2014 (79 FR 20802). The DPS includes all naturally spawning populations of A-run and B-run steelhead originating below natural and manmade impassable barriers in the Snake River and its tributaries. Critical habitat encompasses all river reaches, including estuarine areas, adjacent riparian zones, and tributaries within the range of this DPS as designated on September 2, 2005 (70 FR 52630).

The SRB DPS historically supported more than 55 percent of total steelhead production in the Columbia River Basin and continues to produce a large percentage. SRB steelhead spawn and rear in all tributaries used by Snake River Chinook salmon as well as many additional smaller tributaries (BLM and USFS 2013).

The Interior Columbia Technical Recovery Team (ICTRT) has identified 24 extant populations within this DPS, organized into six major population groups. The six groups include the following (NMFS 2016b):

- Lower Snake River (two extant populations)
- Grande Ronde River (four extant populations)
- Clearwater River (five extant populations)
- Salmon River (twelve extant populations)
- Imnaha River (one extant population)

The ICTRT also identified a number of potential historical populations associated with watersheds above the Hells Canyon Dam complex on the mainstem Snake River, a barrier to anadromous migration (NMFS 2014).

Of the six major population groups, the Grande Ronde River groups fall in the proposed B2H Project area.

Adult SRB steelhead return to mainstem rivers from late summer through fall, where they hold in larger rivers for several months before moving upstream into smaller tributaries. Adult dispersal toward spawning areas varies with elevation, with the majority of adults dispersing into tributaries from March through May, with earlier dispersal at lower elevations and later dispersal at higher elevations. Spawning begins shortly after fish reach spawning areas, typically during a rising hydrograph but prior to peak flows. Steelhead, typically, select spawning areas at the downstream end of pools, in gravels ranging in size from 0.5 to 4.5 inches in diameter. Juveniles emerge from redds in 4 to 8 weeks, depending on temperature. After emergence, fry have poor swimming ability and initially move from the redds into shallow, low-velocity areas in side channels and along channel margins to escape high velocities and predators; the young fish progressively move toward deeper water as they grow in size. Juveniles typically reside in fresh water for 2 to 3 years or longer depending on water temperature and growth rate. Smolts in the Snake River Basin migrate downstream during spring runoff, from March to mid-June depending on elevation (BLM and USFS 2013).

SRB steelhead exhibit two distinct morphological forms, identified as A-run and B-run fish, which are distinguished by differences in body size, run timing, and length of ocean residence. B- run fish predominantly reside in the ocean for 2 years, while A-run fish typically spend only 1 year in the ocean. As a result of this difference, B-run steelhead are typically larger than A-run steelhead. The smaller size of A-run adults allows them to spawn in smaller headwater streams and tributaries. The differences between the two fish stocks represent an important component of phenotypic and genetic diversity of the SRB steelhead DPS, exhibited through the asynchronous timing of ocean residence, segregation of spawning by stream size, and possible differences in the habitats the fish use in the ocean (BLM and USFS 2013).

SRB summer steelhead and designated critical habitat occur in several streams crossed by the B2H Project in the Upper Grande Ronde River subbasin in Segment 2 (MV-11).

Snake River Spring Chinook Salmon (*Oncorhynchus tshawytscha*)

The SR spring/summer-run Chinook salmon ESU was first listed as threatened on April 22, 1992 (57 FR 14653), and after a status review was again listed as threatened on June 28, 2005 (70 FR 37160) and updated (no change in status occurred) April 14, 2014 (79 FR 20802). Critical habitat encompasses all river reaches, including estuarine areas, adjacent riparian zones, and tributaries within the range of this ESU as designated on October 25, 1999 (64 FR 57399).

This ESU includes all naturally spawned populations of spring/summer-run Chinook salmon in the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins; and progeny of 15 artificial propagation programs (NMFS 2014).

The ICTRT currently believes there are 28 extant and four extirpated populations of SR spring/summer-run Chinook salmon. SR spring/summer-run Chinook salmon are divided into the following major population groups (NMFS 2016b):

- Lower Snake River (one extant and one extirpated population)
- Grande Ronde and Imnaha Rivers (six extant and two extirpated populations)
- South Fork Salmon River (four extant populations)
- Middle Fork Salmon River (nine extant populations)
- Upper Mainstem Salmon River (eight extant and one extirpated population)

Each of these populations faces a "high" risk of extinction. Although recent natural spawning abundance estimates have increased, all populations remain below minimum natural origin abundance thresholds (NMFS 2014).

Of the five major population groups, the Grande Ronde/Imnaha River groups fall within the proposed B2H Project area.

Adult SR spring/summer Chinook salmon enter the Columbia River on their upstream spawning migration from February through March and arrive at their natal tributaries from June through August. Spawning occurs in August and September. Juveniles exhibit a river-type life history strategy, rearing in their natal streams during their first summer of life before beginning their migration to the ocean the following spring. After reaching the ocean as smolts, the fish typically rear 2 to 3 years in the ocean before beginning their migration back to freshwater (BLM and USFS 2013).

In the Upper Grande Ronde River subbasin (Segment 2), the B2H Project would cross occupied Snake River spring/summer Chinook salmon habitat in the mainstem Grande Ronde River and Rock Creek. ESA-listed Snake River Chinook salmon have been observed within the lower four miles of Rock Creek during surveys in 2015 conducted by CTUIR and the Columbia River Intertribal Fisheries Commission (Pers. Comm. Les Naylor, CTUIR, August and September 2015).

Critical habitat also is designated for this ESU in the same areas.

Coho Salmon (*Oncorhynchus kisutch*)

Coho salmon were extirpated from the Grande Ronde subbasin in the 1980s (NPCC 2004b). However, because of historical use by coho salmon within the subbasin, current use by Chinook salmon, and potential passage into the subbasin above downstream dams, Amendment 18 of the Pacific Coast Salmon Plan (PFMC and NMFS 2014) designated EFH under the MSA for coho salmon within portions of the Grande Ronde River Subbasin.

The B2H Project crosses the Grande Ronde River and Rock Creek, located within the Upper Grande Ronde River subbasin, which are designated as coho salmon EFH. Coho salmon EFH mapping is incomplete in the B2H Project analysis area; therefore, Chinook salmon EFH is used as the surrogate for the EFH resource inventory.

Umatilla River, Upper Grande Ronde River, and Powder River Subbasins (Segments 1, 2, and 3)

Columbia River Basin Bull Trout (*Salvelinus confluentus*)

The following information is excerpted from the Biological Assessment for programmatic actions by the BLM and the USFS within the Blue Mountains region of Oregon and Washington (BLM and USFS 2013). The CR DPS of bull trout was listed as a threatened species on June 10, 1998 (63 FR 31647). The final rule to designate critical habitat for bull trout was published in the *Federal Register* October 18, 2010 (50 CFR Part 17).

Bull trout historically occurred in major river drainages in the Pacific Northwest from about 41°N to 60°N latitude, from the southern limits in the McCloud River in northern California and the Jarbidge River in Nevada, north to the headwaters of the Yukon River in the Northwest Territories, Canada. Bull trout exhibit both resident and migratory life-history strategies through much of their current range. These include anadromous (migratory between salt and fresh water), resident, adfluvial (lake-dwelling), and fluvial (migratory stream- and river-dwelling) populations. Resident bull trout complete their life cycles in the tributary streams in which they spawn and rear. Migratory bull trout spawn in tributary streams, and juvenile fish rear from 1 to 4 years before migrating to a lake, river, or saltwater to mature.

Bull trout are most often associated with undisturbed habitat characterized by diverse cover and structure (e.g., LWD, undercut banks, boulders, and pools). Maintaining bull trout populations requires stream channel and flow stability. Bull trout appear to have more specific habitat requirements than other salmonids, which limits their spawning to cold, clean, generally pristine streams, often within headwater reaches. Bull trout do not reach breeding maturity until 3 to 5 years of age at lengths of approximately 250 millimeters or larger. Large bull trout typically inhabit pools containing concentrations of woody debris. Very few bull trout inhabit areas without some wood component (Buchanan et al. 1997). Spawning usually occurs during September and October in headwater streams when water temperatures are below 50°F. Depending on water temperature, incubation is normally 100 to 145 days, with eggs remaining in spawning gravels up to six inches (in) deep until spring, when the fry emerge. Water temperatures above 59°F are thought to limit bull trout distribution.

ESA-listed CR bull trout are present within the first two segments of the B2H Project area. Bull trout are also present within Segment 3; however, they are not present within the B2H Project analysis area. Within these three segments bull trout are present within the following subbasins:

- Segment 1 – Umatilla/Willow Subbasin
- Segment 2 – Upper Grande Ronde Subbasin
- Segment 3 – Powder River Subbasin

Also, the B2H Project area is located within the geographic regions associated with the 2015 USFWS Mid-Columbia Recovery Unit Implementation Plan for Bull Trout. Within these geographic regions, the Mid-Columbia Recovery Unit comprises 24 core areas, three of which, Umatilla, Upper Grande Ronde, and Powder River, are located within the B2H Project area.

Because of poor water quality conditions in much of the Umatilla subbasin, bull trout are isolated in the headwaters of the Umatilla River and Meacham Creek. However, bull trout have been found to use the mainstem of the Umatilla River for migration. It appears that spawning and rearing is restricted to the North and South Forks of the Umatilla River and the North Fork Meacham Creek. While bull trout have been documented in other streams within the subbasin such as the North Fork of Meacham Creek, South Fork Umatilla River, lower McKay Creek, Iskuulpa Creek and Ryan Creek, little abundance data exist for these streams (NPCC 2004a).

Within the Grande Ronde River subbasin, bull trout currently spawn and rear in the Upper Grande Ronde River and tributary streams of the upper river where critical habitat also is designated (USFWS 2010). These stream reaches are located upstream of the area where the Proposed Action would cross the Grande Ronde River. However, bull trout can migrate in the mainstem river through the area of the Project where critical habitat also is designated for migration.

Within the Powder River subbasin, bull trout are currently restricted to the headwater areas of Lake Creek, upper Powder River (Silver Creek and Little Cracker Creek), Rock Creek, Big Muddy Creek, Salmon Creek, Pine Creek, N. Powder River, Anthony Creek, Indian Creek, and Wolf Creek. Bull trout are suspected to be in Eagle Creek (NPCC 2004b). Critical habitat for bull trout is designated in some of these streams, including the Powder River from the confluence of Wolf Creek to the confluence of North Powder River, North Powder River, and Wolf Creek above the confluence with the Powder River (USFWS 2010). The B2H Project would not cross any stream reaches designated as critical habitat for bull trout within the Powder River subbasin.

At the time of initial listing as a threatened species, bull trout were estimated to have been extirpated from approximately 60 percent of their historical range. Reasons for bull trout decline include: habitat loss and fragmentation, interaction with nonnative species, poor water quality, and fish passage issues (USFWS 2015). The 2015 USFWS Bull Trout Recovery Plan outlines conservation actions needed to boost populations in six recovery units. Two of the recovery units, the Mid-Columbia Recovery Unit and the Upper Snake Recovery Unit, are located in the B2H Project area.

The only waterways crossed by the B2H Project that support bull trout and are designated as critical habitat are the Umatilla River and Grande Ronde River. It is anticipated that waterways occupied by bull trout would be spanned; therefore, the B2H Project would not impact bull trout recovery efforts.

Pacific Lamprey (*Entosphenus tridentatus*)

The Pacific lamprey (*Entosphenus tridentatus*, formerly *Lampetra tridentata*) is an anadromous and parasitic fish. Pacific lamprey were historically widespread along the West Coast of North America; however, their abundance is declining and their distribution is contracting throughout their historical range (USFWS 2012).

Pacific lamprey are jawless fishes which lack paired fins, vertebrae, or a swim bladder and possess an elongated, cylindrical body and suctorial disk mouth. Adult Pacific lamprey cannot jump, but can pull themselves over obstacles if the surface is wetted and they are able to get a complete seal with their suctorial disk.

Pacific Lamprey spend between 6 months to 3.5 years in the marine environment before returning to freshwater during spring and summer months. They spend approximately 1 year in freshwater habitat before spawning. Spawning generally occurs between March and July in gravel bottom streams. Suitable habitat for ammocoetes consists of low-velocity pools and stream margins with a dominant substrate of fine silt, sand, or small gravels. Ammocoetes are mostly sedentary, remaining burrowed in the stream substrate for 3 to 7 years, filter feeding on algae, diatoms, and detritus. Out-migration to the marine environment generally occurs with rising stream and river flows in late winter or early spring (USFWS 2010).

Pacific lamprey distribution has been divided into ten Regional Management Units (RMUs). The B2H Project area is located within the Columbia River Basin Regions (Lower Columbia/Willamette, Mid-Columbia, Upper Columbia, Snake, Mainstem) RMU. Within this RMU, Pacific lamprey are at 'high risk' throughout much of the Columbia River Basin, particularly in the Snake River, the Mid-Columbia and the Upper Columbia regions. The main threats affecting these RMUs include restricted mainstem and tributary passage, stream and floodplain degradation, and 'small population' effects (USFWS 2010).

Based on StreamNet data, Pacific lamprey are mapped only within the Mid-Columbia River in Segment 1 of the B2H Project area (StreamNet 2016). However, according to Western Native Fishes Committee data, Pacific lamprey are verified within their historic range within Segments 1 through 3 of the B2H Project area, although specific locations of lamprey presence is not available. Pacific lamprey within Segments 4 through 6 are not verified and/or are extirpated within their historic range (WNFC 2011).

Based on ODFW data, Pacific lamprey occupy the mainstem Umatilla River and are assumed potentially present within perennial tributaries, including lower Meacham Creek. The CTUIR has been actively working to restore Pacific lamprey populations to the Umatilla River basin through translocation, and led the effort to enhance passage throughout the Umatilla basin for adult lamprey. Adult lamprey passage structures have been installed on all three of Reclamation's diversions on the mainstem Umatilla River (Reclamation 2013).

Redband Trout (*Oncorhynchus mykiss gairdneri*)

Inland Columbia Basin redband trout, a subspecies of *O. mykiss,* occupies inland watersheds of the Columbia River Basin in central and eastern Oregon as well portions of southwestern Idaho within the B2H Project area. Within this broad distributional area, habitats vary from higher elevation cold water streams to lower elevation warmer desert-type streams that are often associated with periods of low stream flows and high water temperatures (May et al. 2012). Redband trout are estimated to occupy 43 percent of historically occupied stream habitats in Oregon and 35 percent in Idaho (May et al. 2012).

Redband trout occur in all perennial fish- bearing streams and some intermittent seasonal streams in the B2H Project area. The presence of riparian vegetation is positively associated with the occurrences and density of redband trout (Dauwalter et al. 2015). The following descriptive information is partially excerpted from the NPCC subbasin plan for the John Day River in central Oregon (NPCC 2005).

The species *O. mykiss* is one of the most taxonomically complicated groups in Oregon. Currens (1997) suggests that separate groups of redband trout evolved in large river systems, such as the Columbia, Deschutes, Klamath and Sacramento rivers. Ancestral redband trout probably reached the Sacramento-San Joaquin basin from the south during the second half of the Pleistocene Epoch and penetrated the Columbia, Fraser, and Athabasca river basins between 30,000 and 50,000 years ago (Behnke 1992; NPCC 2005).

Redband trout tend to spawn in rivers and streams during the spring months of March, April and May. Cool, clean, well-oxygenated water is necessary for the eggs to survive. Redband trout fry emerge from the gravel in June and July. For the most part, they live near where they were spawned. Redband trout are three years old at maturity, with size varying depending on the productivity of individual waters (NPCC 2005; ODFW 1996). After young trout emerge from the spawning gravel, they often rear in low-velocity areas associated with stream margin habitats, high cover areas and interstitial spaces. Adults require habitat for resting and feeding and, thus, are generally found in areas of abundant cover associated with deep pools, large organic material, undercut stream banks and overhanging vegetation. Over-winter sites, characterized by low-velocity areas with cover, including large woody debris, are important to all age classes (Bjornn and Reiser 1991; NPCC 2005).

Steelhead and redband trout are sympatric (occupying the same range without loss of identity from interbreeding) in all basins that contain steelhead. Sympatric populations with different life histories form different populations due to assortative mating, but are not reproductively isolated from each other (Currens 1987; NPCC 2005). Each morphology appears to be able to produce offspring of the other type. Redband males have been observed to pair with steelhead females, particularly when steelhead populations are small. Redband trout populations also occur above barriers to anadromous fish (Kostow 1995; NPCC 2005).

Redband trout occur sympatrically with MCR summer steelhead in various streams within the Umatilla River subbasin (Project Segments 1 and 2). Both of these subspecies occur in several streams that would be crossed by the Proposed Action. Redband trout and SRB summer steelhead occur sympatrically in numerous streams within the Upper Grande Ronde River subbasin (Segment 2). Both of these subspecies occur in several streams that would be crossed by the Proposed Action. Within the Upper Grande Ronde River subbasin and the study corridor, redband trout also occur in stream reaches not occupied by SRB steelhead, including Little Graves Creek, Little Rock Creek, upper Ladd Creek, and East Fork Ladd Creek.

Within the Powder River subbasin and the study corridor for the B2H Project, the distribution of redband trout is widespread. The steelhead life history was extirpated above Thief Valley Dam in 1932 and completely extirpated from the subbasin with construction of the Hell's Canyon Complex of dams. However, redband trout within the subbasin exhibit resident, fluvial and adfluvial life histories in various locations in the subbasin depending, in part, on the presence of passage barriers (NPCC 2004b). Redband trout may occur in several streams that would be crossed by the B2H Project (MV-11).

TRADITIONAL FOODS

Traditional foods are an integral part of Native American culture; water and fish have been and continue to be important staples for tribes in the northwest.

Water is considered both a traditional food and a resource that facilitates the production of many other traditional foods. Therefore, good water quality and sufficient water quantity in rivers and streams within the B2H Project area is not only important as a traditional food source, but also important in supporting river-derived traditional foods such as fish.

Fish have been one of the most affected traditional food resources, due in large part to dam creation and irrigation allotment, limiting the water present in many regional rivers and creeks (CCRH 2016b, 2016c). Fish that occur in the B2H Project area and are considered a traditional food source for southern Columbia Plateau and northern Great Basin tribal groups include salmonids (Chinook salmon, coho salmon, steelhead, rainbow/redband trout, and whitefish), sturgeon, and eel (lamprey). It is anticipated that all perennial streams and some intermittent streams within the B2H Project area support at least one traditional food fish.

SEGMENT 1—MORROW-UMATILLA

Segment 1 begins in the Middle Columbia-Lake Wallula subbasin in the northwest, crosses the Umatilla subbasin and concludes in the Upper Grande Ronde subbasin to the southeast.

Table 3-203 presents the resource inventory for fish resources crossed by all alternative routes and route variation centerlines in Segment 1.

Table 3-203. Fish Resources Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)				
		Bull Trout Critical Habitat	Chinook Salmon Essential Fish Habitat[1]	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams
Applicant's Proposed Action	91.9	0.0	0.0	0.1	0.1	1.6
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.4*	*0.4*
East of Bombing Range Road	92.3	0.0	0.0	0.1	0.1	1.6
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	0.4	0.1	1.6
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	0.7	0.1	2.0
Longhorn	88.2	0.0	0.0	0.1	0.1	1.6

Table 3-203. Fish Resources Inventory Data for Segment 1—Morrow-Umatilla						
Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)				
		Bull Trout Critical Habitat	Chinook Salmon Essential Fish Habitat[1]	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams
Interstate 84	84.7	0.2	0.3	0.3	0.1	2
Variation S1-A1	*18.5*	*0.1*	*0.2*	*0.1*	*0.0*	*0.6*
Variation S1-A2	*18.5*	*0.2*	*0.2*	*0.2*	*0.0*	*0.3*
Interstate 84 – Southern Route	93.4	0.2	0.3	0.6	0.1	2.0
Table Note: Chinook salmon EFH is used as the surrogate for the EFH resource inventory.						

Although coho salmon EFH is present within Segment 1, coho salmon EFH mapping is incomplete in the B2H Project analysis area; therefore, Chinook salmon EFH is used as the surrogate for the EFH resource inventory. Coho salmon EFH is described where applicable in the following sections.

Table 3-204 summarizes fish presence in streams crossed by all alternative route and route variation centerlines in Segment 1.

Table 3-204. Fish Presence in Segment 1—Morrow-Umatilla			
Alternative Route	Total Length (miles)	Streams Crossed	Fish Presence
Applicant's Proposed Action	91. 9	Butter Creek	Redband trout
		Birch Creek	Redband trout Steelhead Steelhead critical habitat Coho EFH
		McKay Creek	Redband trout
		Rail Creek	Redband trout
		Little Beaver Creek	Redband trout
		Beaver Creek	Redband trout
		Dry Creek	Redband trout Steelhead Steelhead critical habitat
Variation S1-B1	*6.4*	*Dry Creek*	*Redband trout* *Steelhead* *Steelhead critical habitat*
Variation S1-B2	*6.4*	*Dry Creek*	*Redband trout* *Steelhead* *Steelhead critical habitat*
		Unnamed Stream, previously California Gulch (LLID 1182983453761)	*Redband trout* *Steelhead* *Steelhead critical habitat*

Table 3-204. Fish Presence in Segment 1—Morrow-Umatilla			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
East of Bombing Range Road	92.3	Butter Creek	Redband trout
		Birch Creek	Redband trout Steelhead Steelhead critical habitat Coho EFH
		McKay Creek	Redband trout
		Rail Creek	Redband trout
		Little Beaver Creek	Redband trout
		Beaver Creek	Redband trout
		Dry Creek	Redband trout Steelhead Steelhead critical habitat
Applicant's Proposed Action – Southern Route	99.1	Butter Creek	Redband trout
		West Birch Creek	Redband trout Steelhead Steelhead critical habitat
		California Gulch	Redband trout Steelhead Steelhead critical habitat
Applicant's Proposed Action – Southern Route	99.1	East Birch Creek	Redband trout
		McKay Creek	Redband trout
		Rail Creek	Redband trout
		Little Beaver Creek	Redband trout
		Beaver Creek	Redband trout
		Dry Creek	Redband trout Steelhead Steelhead critical habitat
West of Bombing Range Road – Southern Route	95.6	Little Butter Creek	Redband trout
		Butter Creek (3 times)	Redband trout
		Bear Creek	Steelhead Steelhead critical habitat Redband trout
		West Birch Creek	Redband trout Steelhead Steelhead critical habitat
		California Gulch	Redband trout Steelhead Steelhead critical habitat
		East Birch Creek	Redband trout
		McKay Creek	Redband trout
		Rail Creek	Redband trout
		Little Beaver Creek	Redband trout
		Beaver Creek	Redband trout

Table 3-204. Fish Presence in Segment 1—Morrow-Umatilla			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
West of Bombing Range Road – Southern Route	95.6	Dry Creek	Redband trout Steelhead Steelhead critical habitat
Longhorn	88.2	Butter Creek	Redband trout
		Birch Creek	Redband trout Steelhead Steelhead critical habitat
		Rail Creek	Redband trout
		McKay Creek	Redband trout
		Little Beaver Creek	Redband trout
		Beaver Creek	Redband trout
		Dry Creek	Redband trout Steelhead Steelhead critical habitat
Interstate 84	84.7	Butter Creek	Redband trout
		Umatilla River (2 times)	Steelhead Steelhead critical habitat Bull trout Bull trout critical habitat Coho EFH Chinook salmon EFH Pacific lamprey Redband trout
		Birch Creek	Steelhead Steelhead critical habitat Redband trout
		Rail Creek	Redband trout
		McKay Creek	Redband trout
		Little Beaver Creek	Redband trout
		Beaver Creek	Redband trout
		Dry Creek	Redband trout Steelhead Steelhead critical habitat
Variation S1-A1	*18.5*	*Umatilla River*	*Steelhead* *Steelhead critical habitat* *Bull trout* *Bull trout critical habitat* *Coho EFH* *Chinook salmon EFH* *Pacific lamprey* *Redband trout*

Table 3-204. Fish Presence in Segment 1—Morrow-Umatilla			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Variation S1-A2	*18.5*	*Umatilla River*	*Steelhead* *Steelhead critical habitat* *Bull trout* *Bull trout critical habitat* *Coho EFH* *Chinook salmon EFH* *Pacific lamprey* *Redband trout*
Interstate 84 – Southern Route	93.4	Butter Creek	Redband Trout
		Umatilla River (2 times)	Steelhead Steelhead critical habitat Bull trout Bull trout critical habitat Coho EFH Chinook salmon EFH Pacific lamprey Redband trout
Interstate 84 – Southern Route	93.4	West Birch Creek	Steelhead Steelhead critical habitat Redband trout
		California Gulch	Steelhead Steelhead critical habitat Redband trout
		East Birch Creek	Steelhead Steelhead critical habitat Redband trout
		McKay Creek	Redband trout
		Rail Creek	Redband trout
		Little Beaver Creek	Redband trout
		Beaver Creek	Redband trout
		Dry Creek	Steelhead Steelhead critical habitat Redband trout
Table Note: EFH = Essential fish habitat			

Applicant's Proposed Action Alternative

Federally Listed and Candidate Fish Species

This alternative route crosses Birch Creek (Link 1-63) and Dry Creek (Link 1-77), which support federally listed MCR and SRB steelhead, respectively.

Sensitive Fish Species

This alternative route crosses Butter Creek (Link 1-45), Birch Creek (Link 1-63), McKay Creek (Link 1-63), Rail Creek (Link 1-65), Little Beaver Creek (Link 1-65), Beaver Creek (Link 1-65), and Dry Creek (Link 1-77). These streams support redband trout.

Protected Fish Habitats

This alternative route crosses Birch Creek (Link 1-63) and Dry Creek (Link 1-77). Designated critical habitat for MCR steelhead is present in Birch Creek and designated critical habitat for SRB steelhead is present in Dry Creek. Coho salmon and associated EFH is present in this segment of Birch Creek.

Variation S1-B1

The variations in this series include Variation S1-B1 and S1-B2. Variation S1-B1 follows a slightly more southern alignment than Variation S1-B2.

Federally Listed and Candidate Fish Species

This variation crosses Dry Creek (Link 1-77) which supports SRB steelhead.

Sensitive Fish Species

This variation crosses Dry Creek (Link 1-77) which supports redband trout.

Protected Fish Habitats

This variation crosses Dry Creek (Link 1-77) which supports designated critical habitat for SRB steelhead.

Variation S1-B2

Variation S1-B2 follows a slightly more northern alignment than Variation S1-B1.

Federally Listed and Candidate Fish Species

This variation crosses Dry Creek (Link 1-75) and an unnamed stream previously named California Gulch (LLID 1182983453761) near the confluence of the two streams. Both streams support SRB steelhead.

Sensitive Fish Species

This variation crosses Dry Creek (Link 1-75) and an unnamed stream previously named California Gulch (LLID 1182983453761) (Link 1-75) near the confluence of the two streams. Both streams support redband trout.

Protected Fish Habitats

This variation crosses Dry Creek (Link 1-75) and an unnamed stream previously named California Gulch (LLID 1182983453761) near the confluence of the two streams. Both streams support designated critical habitat for SRB steelhead.

Additional Action – 69-Kilovolt Line Replacement

Federally Listed and Candidate Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Protected Fish Habitats

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

East of Bombing Range Road Alternative

Federally Listed and Candidate Fish Species

This alternative route crosses Birch Creek (Link 1-63), which supports federally listed MCR steelhead, and Dry Creek (Link 1-77), which supports federally listed SRB steelhead.

Sensitive Fish Species

This alternative crosses Butter Creek (Link 1-45), Birch Creek (Link 1-63), McKay Creek (Link 1-63), Rail Creek (Link 1-65), Little Beaver Creek (Link 1-65), Beaver Creek (Link 1-65), and Dry Creek (Link 1-77). These streams support redband trout.

Protected Fish Habitats

This alternative crosses Birch Creek (Link 1-63) and Dry Creek (Link 1-77). Designated critical habitat for MCR steelhead is present in Birch Creek and designated critical habitat for SRB steelhead is present in Dry Creek. Coho salmon and associated EFH is present within this segment of Birch Creek.

Applicant's Proposed Action – Southern Route Alternative

Federally Listed and Candidate Fish Species

This alternative crosses West Birch Creek (Link 1-83), California Gulch (Link 1-66), and East Birch Creek (Link 1-66), which support federally listed MCR steelhead. This alternative also crosses Dry Creek (Link 1-77), which supports federally listed SRB steelhead.

Sensitive Fish Species

This alternative crosses Butter Creek (Link 1-45), West Birch Creek (Link 1-83), California Gulch (Link 1-66), East Birch Creek (Link 1-66), McKay Creek (Link 1-66), Rail Creek (Link 1-65), Little Beaver Creek (Link 1-65), Beaver Creek (Link 1-65), and Dry Creek (Link 1-77). These streams support redband trout.

Protected Fish Habitats

This alternative crosses West Birch Creek (Link 1-83), California Gulch (Link 1-66), and East Birch Creek (Link 1-66), which support designated critical habitat for MCR steelhead. Designated critical habitat for SRB steelhead is present in Dry Creek (Link 1-77).

Additional Action – 69-Kilovolt Line Replacement

Federally Listed and Candidate Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Protected Fish Habitats

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

West of Bombing Range Road – Southern Route Alternative

Federally Listed and Candidate Fish Species

This alternative crosses Bear Creek (Link 1-64), West Birch Creek (Link 1-64), California Gulch (Link 1-66), and East Birch Creek (Link 1-66), all of which support federally listed MCR steelhead. This alternative also crosses Dry Creek (Link 1-77), which supports federally listed SRB steelhead.

Sensitive Fish Species

This alternative crosses Little Butter Creek (Link 1-36), Butter Creek three times (Link 1-36, 1-62, and 1-64), Bear Creek (Link 1-64), West Birch Creek (Link 1-64), California Gulch (Link 1-66), East Birch Creek (Link 1-66), McKay Creek (Link 1-66), Rail Creek (Link 1-65), Little Beaver Creek (Link 1-65), Beaver Creek (Link 1-65), and Dry Creek (Link 1-77). These streams support redband trout.

Protected Fish Habitats

This alternative crosses Bear Creek (Link 1-64), West Birch Creek (Link 1-64), California Gulch (Link 1-66), and East Birch Creek (Link 1-66). Designated critical habitat for MCR steelhead is present in these streams. Designated critical habitat for SRB steelhead is present in Dry Creek.

Additional Action – 69-Kilovolt Line Replacement

Federally Listed and Candidate Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Protected Fish Habitats

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Longhorn Alternative

Federally Listed and Candidate Fish Species

This alternative crosses Birch Creek (Link 1-63) and Dry Creek (Link 1-77), which support federally listed MCR and SRB steelhead, respectively.

Sensitive Fish Species

This alternative crosses Butter Creek (Link 1-45), Birch Creek (Link 1-63), McKay Creek (Link 1-63), Rail Creek (Link 1-65), Little Beaver Creek (Link 1-65), Beaver Creek (Link 1-65), and Dry Creek (Link 1-77). These streams support redband trout.

Protected Fish Habitats

This alternative crosses Birch Creek (Link 1-63) and Dry Creek (Link 1-77). Designated critical habitat for MCR steelhead is present in Birch Creek, and designated critical habitat for SRB steelhead is present in Dry Creek. Coho salmon and associated EFH is present within this segment of Birch Creek.

Interstate 84 Alternative and Variations

Federally Listed and Candidate Fish Species

This alternative crosses the Umatilla River twice (Link 1-23 and 1-31) and Birch Creek (Link 1-63), which support federally listed MCR steelhead. The Umatilla River also supports federally listed bull trout. This alternative also crosses Dry Creek (Link 1-77), which supports federally listed SRB steelhead.

Sensitive Fish Species

This alternative crosses Butter Creek (Link 1-23), the Umatilla River twice (Link 1-23 and 1-31), Birch Creek (Link 1-63), McKay Creek (Link 1-63), Rail Creek (Link 1-65), Little Beaver Creek (Link 1-65), Beaver Creek (Link 1-65), and Dry Creek (Link 1-77). These streams support redband trout, and the Umatilla River supports Pacific lamprey.

Protected Fish Habitats

This alternative crosses the Umatilla River twice (Link 1-23 and 1-31), and Birch Creek (Link 1-63), which support designated critical habitat for MCR steelhead. Designated critical habitat for SRB steelhead is present in Dry Creek (Link 1-77). Designated critical habitat for bull trout is present in the Umatilla River. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River. Coho salmon and associated EFH is present in this portion of Birch Creek.

Variation S1-A1

The variations in this series include Variation S1-A1 and S1-A2. Variation S1-A1 follows a slightly more northern alignment than Variation S1-A2. Variation S1-A1 crosses the Umatilla River at the same location as the Interstate 84 Alternative.

Federally Listed and Candidate Fish Species

This variation crosses the Umatilla River (Link 1-31) which supports federally listed MCR steelhead and bull trout.

Sensitive Fish Species

This variation crosses the Umatilla River (Link 1-31) which supports redband trout and Pacific lamprey.

Protected Fish Habitats

This variation crosses the Umatilla River (Link 1-31) which supports designated critical habitat for MCR steelhead and bull trout. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River.

Variation S1-A2

Variation S1-A2 follows a slightly more southern alignment than Variation S1-A1.

Federally Listed and Candidate Fish Species

As with Variation S1-A2, this variation crosses only the Umatilla River (Link 1-37) which supports federally listed MCR steelhead and bull trout.

Sensitive Fish Species

As with Variation S1-A2, this variation crosses only the Umatilla River (Link 1-37), which supports redband trout and Pacific lamprey.

Protected Fish Habitats

As with Variation S1-A2, this variation crosses only the Umatilla River (Link 1-37) which supports designated critical habitat for MCR steelhead and bull trout. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River.

Interstate 84 – Southern Route Alternative

Federally Listed and Candidate Fish Species

This alternative crosses the Umatilla River twice (Link 1-23 and 1-31), West Birch Creek (Link 1-83), California Gulch (Link 1-66), and East Birch Creek (Link 1-66), all of which support federally listed MCR steelhead. This alternative also crosses Dry Creek (Link 1-77), which supports federally listed SRB steelhead. The Umatilla River also supports federally listed bull trout.

Sensitive Fish Species

This alternative crosses Butter Creek, the Umatilla River twice (Link 1-23 and 1-31), West Birch Creek (Link 1-83), California Gulch (Link 1-66), East Birch Creek (Link 1-66), McKay Creek (Link 1-66), Rail Creek (Link 1-65), Little Beaver Creek (Link 1-65), Beaver Creek (Link 1-65), and Dry Creek (Link 1-77). These streams support redband trout. The Umatilla River also supports Pacific lamprey.

Protected Fish Habitats

This alternative crosses the Umatilla River twice (Link 1-23 and 1-31), West Birch Creek (Link 1-83), California Gulch (Link 1-66), and East Birch Creek (Link 1-66), which support designated critical habitat

for MCR steelhead. Designated critical habitat for SRB steelhead is present in Dry Creek (Link 1-77). Designated critical habitat for bull trout is present in the Umatilla River. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River.

SEGMENT 2—BLUE MOUNTAINS

Segment 2 begins in the Wallowa-Whitman National Forest and Umatilla subbasin in the northwest, crosses the Upper Grande Ronde River subbasin and ends in the Clover Creek Valley to the southeast. Streams in this segment drain to the Snake River to the north.

Table 3-205 presents the resource inventory for fish resources crossed by all alternative route and route variation centerlines in Segment 2.

Table 3-205. Fish Resources Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)				
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat[1]	Middle Columbia River Steelhead Critical Habitat[2]	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams
Applicant's Proposed Action	33.8	0.1	0.3	0.0	0.7	2.3
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.2*	*0.0*	*0.4*	*0.4*
Variation S2-B2	*3.8*	*0.0*	*0.2*	*0.0*	*0.4*	*0.3*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.2*	*0.3*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.3*	*0.6*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*
Glass Hill	33.7	0.1	0.1	0.0	0.6	2.6
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.5*	*0.4*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.4*	*0.4*
Mill Creek	34.0	0.1	0.2	0.0	0.6	1.4

Table Notes:
[1]Chinook salmon Critical Habitat is used as a surrogate for Chinook salmon and coho salmon Essential Fish Habitat
[2]MCR steelhead or associated critical habitat does not occur in Segment 2.

Table 3-206 summarizes fish presence in streams crossed by all alternative route and route variation centerlines in Segment 2.

Table 3-206. Fish Presence in Segment 2—Blue Mountains			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Applicant's Proposed Action	33.8	Ladd Creek	SRB Steelhead Steelhead critical habitat Redband trout
		Grande Ronde River	SRB Steelhead Steelhead critical habitat SR Chinook salmon Chinook salmon critical habitat Chinook salmon EFH Bull trout Bull trout critical habitat Coho salmon EFH `Redband trout
Applicant's Proposed Action	33.8	Rock Creek	SRB Steelhead Steelhead critical habitat SR Chinook salmon Chinook salmon critical habitat Chinook salmon EFH Coho salmon EFH Redband trout
		Sheep Creek	Redband trout
		Graves Creek	SRB Steelhead Steelhead critical habitat Redband trout
		Powder River	Redband trout
Applicant's Proposed Action	33.8	Unnamed stream (1181152452353)	SRB Steelhead Steelhead critical habitat Redband trout
Variation S2-A1	*2.8*	*None*	*None*
Variation S2-A2	*2.9*	*None*	*None*
Variation S2-B1	*3.7*	*Rock Creek*	*SRB Steelhead* *Steelhead critical habitat* *SR Chinook salmon* *Chinook salmon critical habitat* *Chinook salmon EFH* *Coho salmon EFH* *Redband trout*
		Sheep Creek	*Redband trout*
Variation S2-B1	*3.7*	*Graves Creek*	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*

Table 3-206. Fish Presence in Segment 2—Blue Mountains			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Variation S2-B2	*3.8*	*Rock Creek*	*SRB Steelhead* *Steelhead critical habitat* *SR Chinook salmon* *Chinook salmon critical habitat* *Chinook salmon EFH* *Coho salmon EFH* *Redband trout*
		Sheep Creek	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
Variation S2-C1	*9.3*	*Unnamed stream (1181152452353)*	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
Variation S2-C2	*8.8*	*Sheep Creek*	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
Variation S2-E1	*2.3*	*Unnamed stream (1180138451966)*	*Redband Trout*
Variation S2-E2	*2.6*	*Unnamed stream (1180138451966)*	*Redband Trout*
Variation S2-F1	*12.1*	*Powder River*	*Redband trout*
Variation S2-F2	*12.2*	*Powder River*	*Redband trout*
Glass Hill	*33.7*	Ladd Creek	SRB Steelhead Steelhead critical habitat Redband trout
		Grande Ronde River	SRB Steelhead Steelhead critical habitat SR Chinook salmon Chinook salmon critical habitat Chinook salmon EFH Coho salmon EFH Bull trout Bull trout critical habitat Redband trout
		Rock Creek	SRB Steelhead Steelhead critical habitat SR Chinook salmon Chinook salmon critical habitat Chinook salmon EFH Coho salmon EFH Redband trout
		Graves Creek	SRB Steelhead Steelhead critical habitat Redband trout
		Powder River	Redband trout

Table 3-206. Fish Presence in Segment 2—Blue Mountains			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Glass Hill	33.7	Unnamed stream (1181404452558)	SRB Steelhead Steelhead critical habitat Redband trout
		Unnamed stream (1181152452353)	SRB Steelhead Steelhead critical habitat Redband trout
Variation S2-D1	*4.3*	*Rock Creek*	*SRB Steelhead* *Steelhead critical habitat* *SR Chinook salmon*
		Graves Creek	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
		Unnamed stream (1181404452558)	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
		Unnamed stream (1181152452353)	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
Variation S2-D2	*4.1*	*Unnamed stream (1181152452353)*	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
		Rock Creek	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
		Graves Creek	*SRB Steelhead* *Steelhead critical habitat* *Redband trout*
Mill Creek	34.0	Mill Creek	SRB Steelhead Steelhead critical habitat Redband trout
		Ladd Creek	SRB Steelhead Steelhead critical habitat Redband trout
		Rock Creek	SRB Steelhead Steelhead critical habitat SR Chinook salmon Chinook salmon critical habitat Chinook salmon EFH Coho salmon EFH Redband trout

Table 3-206. Fish Presence in Segment 2—Blue Mountains			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Mill Creek	34.0	Grande Ronde River	SRB Steelhead Steelhead critical habitat SR Chinook salmon Chinook salmon critical habitat Chinook salmon EFH Coho salmon EFH Bull trout Bull trout critical habitat Redband trout
		Powder River	Redband trout
Table Notes: EFH = Essential fish habitat SR = Snake River SRB = Snake River Basin			

Applicant's Proposed Action Alternative

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative crosses Ladd Creek (Link 2-52), the Grande Ronde River (Link 2-20), Rock Creek (Link 2-35), Graves Creek (Link 2-35), and an unnamed stream (1181152452353) (Link 2-47), which support federally listed SRB steelhead. The Grande Ronde River and Rock Creek support federally listed SR Chinook salmon.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses Ladd Creek (Link 2-52), the Grande Ronde River (Link 2-20), Rock Creek (Link 2-35), Sheep Creek (Link 2-35), Graves Creek (Link 2-35), Powder River (Link 2-85), and an unnamed stream (1181152452353) (Link 2-47), which support redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative crosses Ladd Creek (Link 2-52), the Grande Ronde River (Link 2-20), Rock Creek (Link 2-35), Graves Creek (Link 2-35), and an unnamed stream (1181152452353) (Link 2-47), which support designated critical habitat for SRB steelhead. The Grande Ronde River and Rock Creek also support SR Chinook salmon designated critical habitat. Coho salmon and Chinook salmon EFH is present within the Grande Ronde River and Rock Creek.

Variation S2-A1

The variations in this series include Variation S2-A1 and S2-A2. Variation S2-A1 follows a slightly more northern alignment than Variation S2-A2.

Federally Listed and Candidate Fish Species

Variation S2-A1, as with Variation S2-A2, does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-A1, as with Variation S2-A2, does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

Variation S2-A1, as with Variation S2-A2, does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-A2

Variation S2-A2 follows a slightly more southerly alignment than Variation S2-A1.

Federally Listed and Candidate Fish Species

As with Variation S2-A1, Variation S2-A2 does not cross any streams that support federally listed or candidate species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S2-A1, Variation S2-A2 does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with Variation S2-A1, Variation S2-A2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-B1

The variations in this series include Variation S2-B1 and S2-B2. Variation S2-B1 follows a slightly more southerly alignment than Variation S2-B2, slightly south of the Mill Creek Alternative.

Federally Listed and Candidate Fish Species

Variation S2-B1 crosses Rock Creek (Link 2-35) and Graves Creek (Link 2-35), which support federally listed SRB steelhead. Rock Creek also supports SR Chinook salmon. Variation S2-B1 and Variation S2-B2 cross two waterways which support federally listed fish species.

Sensitive Fish Species

Variation S2-B1 crosses Rock Creek (Link 2-35), Sheep Creek (Link 2-35), and Graves Creek (Link 2-35). These streams support redband trout. Variation S2-B1 crosses three waterways which support redband trout, Variation S2-B2 crosses two.

Protected Fish Habitats

Variation S2-B1 crosses Rock Creek (Link 2-35) and Graves Creek (Link 2-35), which support designated critical habitat for SRB steelhead. Rock Creek also supports critical habitat for SR Chinook salmon. Coho salmon and Chinook salmon EFH is present within Rock Creek. Variation S2-B1 and Variation S2-B2 cross two waterways which support protected fish habitats.

Variation S2-B2

Variation S2-B2 follows a slightly more northerly alignment than Variation S2-B1, south of the Mill Creek Alternative.

Federally Listed and Candidate Fish Species

This alternative crosses Rock Creek (Link 2-25) and Sheep Creek (Link 2-25), which support federally listed SRB steelhead. Rock Creek also supports SR Chinook salmon. Both variations, Variation S2-B2 and Variation S2-B1, cross two waterways which support federally listed fish species.

Sensitive Fish Species

Variation S2-B2 crosses Rock Creek (Link 2-25) and Sheep Creek (Link 2-25). These streams support redband trout. Variation S2-B2 crosses two waterways which support redband trout, Variation S2-B1 crosses three.

Protected Fish Habitats

Variation S2-B2 crosses Rock Creek (Link 2-25) and Sheep Creek (Link 2-25), which support designated critical habitat for SRB steelhead. Rock Creek also supports critical habitat for SR Chinook salmon. Coho salmon and Chinook salmon EFH is present within Rock Creek. Variation S2-B2 and Variation S2-B1 cross two waterways which support protected fish habitats.

Variation S2-C1

The variations in this series include Variation S2-C1 and S2-C2. Variation S2-C1 follows a slightly more westerly alignment than Variation S2-C2.

Federally Listed and Candidate Fish Species

Variation S2-C1 crosses an unnamed stream (1181152452353) (Link 2-47), which supports federally listed SRB steelhead. Both variations, Variation S2-C1 and Variation S2-C2, cross one waterway which supports federally listed steelhead.

Sensitive Fish Species

Variation S2-C1 crosses an unnamed stream (1181152452353) (Link 2-47), which supports redband trout. Both variations, Variation S2-C1 and Variation S2-C2, cross one waterway which supports redband trout.

Protected Fish Habitats

Variation S2-C1 crosses an unnamed stream (1181152452353) (Link 2-47), which supports designated critical habitat for SRB steelhead. Both variations, Variation S2-C1 and Variation S2-C2, cross one waterway which supports steelhead critical habitat.

Variation S2-C2

Variation S2-C2 follows a slightly more easterly alignment than Variation S2-C1.

Federally Listed and Candidate Fish Species

Variation S2-C2 crosses Sheep Creek (Link 2-48), which supports federally listed SRB steelhead. Both variations, Variation S2-C2 and Variation S2-C1, cross one waterway which supports federally listed steelhead.

Sensitive Fish Species

Variation S2-C2 crosses Sheep Creek (Link 2-48), which supports redband trout. Both variations, Variation S2-C2 and Variation S2-C1, cross one waterway which supports redband trout.

Protected Fish Habitats

Variation S2-C2 crosses Sheep Creek (Link 2-48), which supports designated critical habitat for SRB steelhead. Both variations, Variation S2-C2 and Variation S2-C1, cross one waterway which supports steelhead critical habitat.

Variation S2-E1

The variations in this series include Variation S2-E1 and S2-E2. Variation S2-E1 follows a slightly more southwesterly alignment than Variation S2-E2, slightly north of Baldy Mountain,

Federally Listed and Candidate Fish Species

Variation S2-E1, as with Variation S2-E2, does not cross any streams that support federally listed or candidate species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-E1, as with Variation S2-E2, crosses an unnamed stream (1180138451966) (Link 2-60), which supports redband trout. Both variations, Variation S2-E1 and Variation S2-E2, cross one waterway which supports redband trout.

Protected Fish Habitats

Variation S2-E1, as with Variation S2-E2, does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-E2

Variation S2-E2 follows a slightly more northern alignment than Variation S2-E1, slightly north of Baldy Mountain and south of Ladd Canyon.

Federally Listed and Candidate Fish Species

As with Variation S2-E1, Variation S2-E2 does not cross any streams that support federally listed or candidate species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-E2 crosses an unnamed stream (1180138451966) (Link 2-55), which supports redband trout. Both variations, Variation S2-E2 and Variation S2-E1, cross one waterway which supports redband trout.

Protected Fish Habitats

As with Variation S2-E1, Variation S2-E2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-F1

The variations in this series include Variation S2-F1 and S2-F2. Variation S2-F1 follows a slightly more southwesterly alignment than Variation S2-F2.

Federally Listed and Candidate Fish Species

Variation S2-F1, as with Variation S2-F2, does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-F1 crosses the Powder River (Link 2-85), which supports redband trout.

Protected Fish Habitats

Variation S2-F1, as with Variation S2-F2, does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-F2

Variation S2-F2 follows a slightly more northerly alignment than Variation S2-F1.

Federally Listed and Candidate Fish Species

As with Variation S2-F1, Variation S2-F2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with S2-F1, Variation S2-F2 crosses the Powder River (Link 2-90), which supports redband trout.

Protected Fish Habitats

As with Variation S2-F1, Variation S2-F2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Glass Hill Alternative

The Glass Hill Alternative and variations generally parallel the Applicant's Proposed Action Alternative in Segment 2, however the Glass Hill Alternative passes to the south and west of Glass Hill.

Federally Listed and Candidate Fish Species

The Glass Hill Alternative crosses Ladd Creek (Link 2-52), the Grande Ronde River (Link 2-20), Rock Creek (Link 2-42), Graves Creek (Link 2-42), and unnamed streams (1181152452353 [Link 2-47] and 1181404452558 [Link 2-42]), which support federally listed SRB steelhead. The Grande Ronde River and Rock Creek also support federally listed SR Chinook salmon. The Glass Hill Alternative is similar to the Applicant's Proposed Action Alternative except for it crosses unnamed stream (1181404452558).

Sensitive Fish Species

The Glass Hill Alternative crosses Ladd Creek (Link 2-52), the Grande Ronde River (Link 2-20), Rock Creek (Link 2-42), Graves Creek (Link 2-42), Powder River (Link 2-85), and unnamed streams (1181152452353 [Link 2-47] and 1181404452558 [Link 2-42]), which support redband trout. The Glass Hill Alternative is similar to the Applicant's Proposed Action Alternative except for it crosses unnamed stream (1181404452558) but does not cross Sheep Creek.

Protected Fish Habitats

The Glass Hill Alternative crosses Ladd Creek (Link 2-52), the Grande Ronde River (Link 2-20), Rock Creek (Link 2-42), Graves Creek (Link 2-42), and unnamed streams (1181152452353 [Link 2-47] and 1181404452558 [Link 2-42]), which support designated critical habitat for SRB steelhead. The Grande Ronde River and Rock Creek also support SR Chinook salmon designated critical habitat. Coho salmon and Chinook salmon EFH is present within the Grande Ronde River and Rock Creek. The Glass Hill Alternative is similar to the Applicant's Proposed Action Alternative except for it crosses unnamed stream (1181404452558).

Variation S2-D1

The variations in this series include Variation S2-D1 and S2-D2. Variation S2-D1 follows a slightly more northerly alignment than Variation S2-D2.

Federally Listed and Candidate Fish Species

Variation S2-D1 crosses Rock Creek (Link 2-42), Graves Creek (Link 2-42), and unnamed streams (1181152452353 [Link 2-47] and 1181404452558 [Link 2-42]), which support federally listed SRB steelhead. This portion of Rock Creek does not support federally listed SR Chinook salmon. Variation S2-D1 is similar to Variation S2-D2 except it crosses unnamed stream (1181404452558).

Sensitive Fish Species

Variation S2-D1 crosses Rock Creek (Link 2-42), Graves Creek (Link 2-42), and unnamed streams (1181152452353 [Link 2-47] and 1181404452558 [Link 2-42]), which support redband trout. Variation S2-D1 is similar to Variation S2-D2 except it crosses unnamed stream (1181404452558).

Protected Fish Habitats

Variation S2-D1 crosses Rock Creek (Link 2-42), Graves Creek (Link 2-42), and unnamed streams (1181152452353 [Link 2-47] and 1181404452558 [Link 2-42]), which support SRB steelhead designated critical habitat. Variation S2-D1 is similar to Variation S2-D2 except it crosses unnamed stream (1181404452558).

Variation S2-D2

Variation S2-D2 follows a slightly more southerly alignment than Variation S2-D1.

Federally Listed and Candidate Fish Species

Variation S2-D2 crosses Rock Creek (Link 2-46), Graves Creek (Link 2-46), and an unnamed stream (1181152452353) (Link 2-46), which support federally listed SRB steelhead. Variation S2-D2 is similar to Variation S2-D1 except it does not cross unnamed stream (1181404452558).

Sensitive Fish Species

Variation S2-D2 crosses Rock Creek (Link 2-46), Graves Creek (Link 2-46), and an unnamed stream (1181152452353) (Link 2-46). These streams support redband trout. Variation S2-D2 is similar to Variation S2-D1 except it does not cross unnamed stream (1181404452558).

Protected Fish Habitats

Variation S2-D2 crosses Rock Creek (Link 2-46), Graves Creek (Link 2-46), and an unnamed stream (1181152452353) (Link 2-46), which support SRB steelhead designated critical habitat. Variation S2-D2 is similar to Variation S2-D1 except it does not cross unnamed stream (1181404452558).

Mill Creek Alternative

The Mill Creek Alternative is routed to the north and east of the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Fish Species

The Mill Creek Alternative crosses Mill Creek (Link 2-12), Ladd Creek (Link 2-63), the Grande Ronde River (Link 2-10), and Rock Creek (Link 2-10), which support federally listed SRB steelhead. The Grande Ronde River and Rock Creek also support federally listed SR Chinook salmon. The Mill Creek Alternative is different to the Applicant's Proposed Action Alternative in that it does not cross Graves Creek or unnamed stream (1181152452353) but crosses Mill Creek.

Sensitive Fish Species

The Mill Creek Alternative crosses Mill Creek (Link 2-12), Ladd Creek (Link 2-63), the Grande Ronde River (Link 2-10), Rock Creek (Link 2-10), and the Powder River (Link 2-90). These streams support redband trout. The Mill Creek Alternative is different to the Applicant's Proposed Action Alternative in that it does not cross Sheep Creek, Graves Creek or unnamed stream (1181152452353) but crosses Mill Creek.

Protected Fish Habitats

The Mill Creek Alternative crosses Mill Creek (Link 2-12), Ladd Creek (Link 2-63), the Grande Ronde River (Link 2-10), and Rock Creek (Link 2-10), which support SRB steelhead designated critical habitat. The Grande Ronde River and Rock Creek also support SR Chinook salmon designated critical habitat. Coho salmon and Chinook salmon EFH is present within the Grande Ronde River and Rock Creek. The Mill Creek Alternative is different to the Applicant's Proposed Action Alternative in that it does not cross Graves Creek or unnamed stream (1181152452353) but crosses Mill Creek.

SEGMENT 3—BAKER VALLEY

Segment 3 begins in the Powder River subbasin in the northwest, crosses the Lower Powder Valley near the Missouri Flats, into the Durkee Valleys and ends in the Burnt River subbasin to the southeast near Weatherby. Streams in this segment drain generally toward the Snake River to the east – southeast.

Table 3-207 presents the resource inventory for fish resources crossed by all alternative route and route variation centerlines in Segment 3.

Table 3-207. Fish Resources Inventory Data for Segment 3—Baker Valley						
Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)				
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat[1]	Middle Columbia River Steelhead Critical Habitat[2]	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams
Applicant's Proposed Action	55.2	0.0	0.0	0.0	0.0	3.8
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*1.1*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*	*2.6*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*	*2.8*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*	*2.2*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*0.0*	*2.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.1*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*0.0*	*1.4*
Flagstaff A	55.3	0.0	0.0	0.0	0.0	3.8
Timber Canyon	70.3	0.0	0.0	0.0	0.0	5.1
Flagstaff A – Burnt River Mountain	55.3	0.0	0.0	0.0	0.0	3.4
Flagstaff B	56.0	0.0	0.0	0.0	0.0	3.8
Flagstaff B – Burnt River West	55.7	0.0	0.0	0.0	0.0	1.7
Flagstaff B – Durkee	59.6	0.0	0.0	0.0	0.0	2.6

Table Notes:
[1]Chinook salmon and SRB steelhead have been extirpated from their historic range in Segment 3 – no critical habitat designated.
[2]MCR steelhead or associated critical habitat does not occur in Segment 3.

Table 3-208 summarizes fish presence in streams crossed by all alternative route and route variation centerlines in Segment 3.

Table 3-208. Fish Presence in Segment 3—Baker Valley			
Alternative Route	Total Length (miles)	Streams Crossed	Fish Presence
Applicant's Proposed Action	55.2	Burnt River	Redband trout
		Dixie Creek	Redband trout
		Durkee Creek	Redband trout
		Manning Creek	Redband trout
		Pritchard Creek	Redband trout
		Sisley Creek	Redband trout
		Unity Creek	Redband trout

Table 3-208. Fish Presence in Segment 3—Baker Valley			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Variation S3-A1	*12.4*	*Gentry Creek*	*Redband trout*
Variation S3-A2	*12.2*	*Gentry Creek*	*Redband trout*
Variation S3-B1	*13.9*	*None*	*None*
Variation S3-B2	*14.4*	*None*	*None*
Variation S3-B3	*14.7*	*None*	*None*
Variation S3-B4	*14.3*	*None*	*None*
Variation S3-B5	*14.0*	*None*	*None*
Variation S3-C1	*21.1*	*Burnt River*	*Redband trout*
		Dixie Creek	*Redband trout*
		Durkee Creek	*Redband trout*
		Manning Creek	*Redband trout*
		Sisley Creek	*Redband trout*
		Unity Creek	*Redband trout*
		Swayze Creek	*Redband trout*
Variation S3-C1	*21.1*	*North Fork Swayze Creek*	*Redband trout*
		Low Creek	*Redband trout*
Variation S3-C2	*21.7*	*Burnt River*	*Redband trout*
		Dixie Creek	*Redband trout*
		Durkee Creek	*Redband trout*
		Manning Creek	*Redband trout*
		Sisley Creek	*Redband trout*
		Unity Creek	*Redband trout*
		Swayze Creek	*Redband trout*
		North Fork Swayze Creek	*Redband trout*
		Low Creek	*Redband trout*
Variation S3-C3	*21.1*	*Burnt River*	*Redband trout*
		Shirttail Creek	*Redband trout*
		Powell Creek	*Redband trout*
		Alder Creek	*Redband trout*
		Low Creek	*Redband trout*
		Dixie Creek	*Redband trout*
Variation S3-C4	*21.4*	*Burnt River*	*Redband trout*
		Shirttail Creek	*Redband trout*
		Powell Creek	*Redband trout*
		Alder Creek	*Redband trout*
		Low Creek	*Redband trout*
		Dixie Creek	*Redband trout*
		Banks Ditch	*Redband trout*

Table 3-208. Fish Presence in Segment 3—Baker Valley			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Variation S3-C5	*21.0*	*Burnt River*	*Redband trout*
		Shirttail Creek	*Redband trout*
		Powell Creek	*Redband trout*
		Alder Creek	*Redband trout*
		Low Creek	*Redband trout*
		Dixie Creek	*Redband trout*
Variation S3-C6	*24.7*	*Burnt River*	*Redband trout*
		Dixie Creek	*Redband trout*
		North Fork Dixie Creek	*Redband trout*
		Alder Creek	*Redband trout*
		Low Creek	*Redband trout*
Flagstaff A	55.3	Burnt River	Redband trout
		Dixie Creek	Redband trout
		Durkee Creek	Redband trout
		Manning Creek	Redband trout
		Pritchard Creek	Redband trout
		Sisley Creek	Redband trout
		Unity Creek	Redband trout
Timber Canyon	70.3	Beagle Creek	Redband trout
		Big Creek	Redband trout
		Burnt River	Redband trout
		Chalk Creek	Redband trout
		Dixie Creek	Redband trout
		Gold Creek	Redband trout
		Goose Creek	Redband trout
		Lick Creek	Redband trout
		McCurry Creek	Redband trout
		North Fork Daly Creek	Redband trout
		Powder River (twice)	Redband trout
		Sisley Creek	Redband trout
		Unnamed Stream (1172125447534 [previously Rock Gulch])	Redband trout
		Unnamed Stream (1176329450110 [previously Bazine Creek])	Redband trout

Table 3-208. Fish Presence in Segment 3—Baker Valley			
Alternative Route	**Total Length (miles)**	**Streams Crossed**	**Fish Presence**
Flagstaff A – Burnt River Mountain	55.3	Alder Creek	Redband trout
		Burnt River	Redband trout
		Burnt River	Redband trout
		Dixie Creek	Redband trout
		Powell Creek	Redband trout
		Shirttail Creek	Redband trout
Flagstaff B	56.0	Burnt River	Redband trout
		Dixie Creek	Redband trout
		Durkee Creek	Redband trout
		Manning Creek	Redband trout
		Pritchard Creek	Redband trout
		Sisley Creek	Redband trout
		Unity Creek	Redband trout
Flagstaff B – Burnt River West	55.7	Alder Creek	Redband trout
		Burnt River	Redband trout
		Dixie Creek	Redband trout
		Powell Creek	Redband trout
Flagstaff B – Durkee	59.6	Alder Creek	Redband trout
		Burnt River	Redband trout
		Dixie Creek	Redband trout
		North Fork Dixie Creek (twice)	Redband trout
		Unnamed stream (1174727444702)	Redband trout
		Unnamed stream (1174799444659)	Redband trout

Applicant's Proposed Action Alternative

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses the Burnt River (Link 3-92), Dixie Creek (Link 3-92), Durkee Creek (Link 3-58), Manning Creek (Link 3-78), Pritchard Creek (Link 3-58), Sisley Creek (Link 3-82), and Unity Creek (Link 3-58), which support redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S3-A1

The variations in this series include Variation S3-A1 and S3-A2. Variation S3-A1 follows a slightly more southern alignment than Variation S3-A2.

Federally Listed and Candidate Fish Species

Variation S3-A1, as with Variation S3-A2, does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-A1 crosses Gentry Creek (Link 3-4), which supports redband trout. Variation S3-A1 is similar to Variation S3-A2.

Protected Fish Habitats

Variation S3-A1, as with Variation S3-A2, does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-A2

Variation S3-A2 follows a slightly more northern alignment than Variation S3-A1.

Federally Listed and Candidate Fish Species

As with Variation S3-A1, Variation S3-A2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S3-A1, Variation S3-A2 crosses Gentry Creek (Link 3-12), which supports redband trout.

Protected Fish Habitats

As with Variation S3-A1, Variation S3-A2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B1

The variations in this series include Variation S3-B1 through S3-B5. Variation S3-B1 follows a more easterly alignment than Variation S3-B2 through Variation S3-B5.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or other candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B2

Variation S3-B2 follows a southern alignment that is located between Variation S3-B1 and Variation S3-B3 through Variation S3-B5.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or other candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B3

Variation S3-B3 follows a southern alignment that is located just west of Variation S3-B2.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or other candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B4

Variation S3-B4 follows a southern alignment that is located in between Variation S3-B3 and Variation S3-B5 for most of its length, then jogs to the west of Variation S3-B3 and remains west and south for the remainder of the alignment.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or other candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B5

Variation S3-B5 follows a southern alignment that begins west of Variation S3-B4, then crosses Variation S3-B4 and Variation S3-B3 at the approximate midpoint of the alignment and parallels Variation S3-B2 along the south to the alignment terminus.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or other candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C1

The variations in this series include Variation S3-C1 through S3-C6. Variation S3-C1 follows a southeastern alignment and is the most northeast Variation in the S3-C variations.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C1 crosses the Burnt River (Link 3-92), Dixie Creek (Link 3-92), Durkee Creek (Link 3-58), Manning Creek (Link 3-78), Sisley Creek (Link 3-82), Low Creek (Link 3-58), Swayze Creek (Link 3-80), North Fork Swayze Creek (Link 3-78), and Unity Creek (Link 3-58), which support redband trout.

Variation S3-C1 crosses the same number of streams as S3-C2 and both variations cross more streams than the rest of the S3-C variations.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C2

Variation S3-C2 follows a southeastern alignment and generally parallels Variation S3-C1 for most of the alignment.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C2 crosses the Burnt River (Link 3-92), Dixie Creek (Link 3-92), Durkee Creek (Link 3-42), Manning Creek (Link 3-78), Sisley Creek (Link 3-82), Low Creek (Link 3-42), Swayze Creek (Link 3-80), North Fork Swayze Creek (Link 3-78), and Unity Creek (Link 3-42), which support redband trout. Variation S3-C2 crosses the same number of streams as S3-C1 and both variations cross more streams than the rest of the S3-C variations.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C3

Variation S3-C3 follows a southeastern alignment and generally parallels the northern edge of Variation S3-C4 for most of the alignment.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C3 crosses the Burnt River (Link 3-64), Dixie Creek (Link 3-92), Powell Creek (Link 3-72), Shirttail Creek (Link 3-72), Alder Creek (Link 3-60), and Low Creek (Link 3-60), which support redband trout. This variation crosses the same streams as S3-C5 and both variations cross fewer streams than Variations S3-C1, S3-C2, and S3-C4 but cross one more stream than Variation S3-C6.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C4

Variation S3-C4 follows a southeastern alignment and generally parallels the southern edge of Variation S3-C3 for most of the alignment.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C4 crosses the Burnt River (Link 3-68), Dixie Creek (Link 3-92), Powell Creek (Link 3-72), Shirttail Creek (Link 3-72), Alder Creek (Link 3-60), Low Creek (Link 3-60), and Banks Ditch (Link 3-68), which support redband trout. Variation S3-C4 crosses fewer streams than Variations S3-C1 and S3-C2 but crosses more streams than the rest of the variations in the S3-C series.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C5

Variation S3-C5 follows a southern alignment initially then turns to the southeast and splits off from Variation S3-C6. Variation S3-C5 does not parallel any other variations within the S3-C variations.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C5 crosses the Burnt River (Link 3-71), Dixie Creek (Link 3-73), Powell Creek (Link 3-73), Shirttail Creek (Link 3-73), Alder Creek (Link 3-60), and Low Creek (Link 3-60), which support redband trout. Variation S3-C5 crosses the same streams as Variation S3-C3 and both variations cross fewer streams than Variations S3-C1, S3-C2, and S3-C4 but cross one more stream than Variation S3-C6.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C6

Variation S3-C6 follows a southern route away from the other variations in the S3-C section and turns back to the east before reconnecting to near the Applicant's Proposed Action Alternative south of Dixie.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C6 crosses the Burnt River (Link 3-74), Dixie Creek (Link 3-90), Alder Creek (Link 3-60), Low Creek (Link 3-60), and North Fork Dixie Creek (Link 3-74), which support redband trout. Variation S3-C6 crosses the fewest number of streams than the rest of the S3-C series.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Flagstaff A Alternative

The Flagstaff A Alternative follows a southeastern alignment and generally parallels the Flagstaff A – Burnt Mountain Alternative for most of the alignment, diverging from the Flagstaff A – Burnt Mountain Alternative around Durkee.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff A Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff A Alternative crosses the Burnt River (Link 3-92), Dixie Creek (Link 3-92), Durkee Creek (Link 3-58), Manning Creek (Link 3-78), Pritchard Creek (Link 3-58), Sisley Creek (Link 3-82), and Unity Creek (Link 3-58), which support redband trout.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff A Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Timber Canyon Alternative

The Timber Canyon Alternative crosses to the north of, and not across, the Thief Valley Reservoir and bends to the southeast inside the Wallowa-Whitman National Forest. The Timber Canyon Alternative curves back to the west and south, just past the Brownlee Reservoir, but does not cross the Brownlee Reservoir.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Timber Canyon Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Timber Canyon Alternative crosses Beagle Creek (Link 3-6), Big Creek (Link 3-8), the Burnt River (Link 3-92), Chalk Creek (Link 3-8), Dixie Creek (Link 3-92), Gold Creek (Link 3-8), Goose Creek (Link 3-8), Lick Creek (Link 3-6), McCurry Creek (Link 3-6), North Fork Daly Creek (Link 3-8), the Powder River (twice) (Link 3-6 and 3-8), Sisley Creek (Link 3-82), and unnamed streams (1172125447534 [previously Rock Gulch - Link 3-8] and 1176329450110 [previously Bazine Creek - Link 3-6]), which support redband trout. The Timber Canyon Alternative crosses eight more waterways which support redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Timber Canyon Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative generally parallels the southern side of the Flagstaff A Alternative for the northern half of its alignment, then diverts slightly south and away from the Flagstaff A Alternative north of Durkee south to Weatherby.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Flagstaff A - Burnt River Mountain Alternative crosses Alder Creek (Link 3-60), the Burnt River (Link 3-64), Dixie Creek (Link 3-92), Powell Creek (Link 3-72), and Shirttail Creek (Link 3-72), which support redband trout. The Flagstaff A – Burnt River Mountain Alternative crosses two fewer streams which support redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Flagstaff B Alternative

The Flagstaff B Alternative generally parallels the northern side of the Flagstaff B – Burnt River West Alternative for the northern half of its alignment, then parallels the southern side of the Flagstaff A Alternative north of Durkee south to Weatherby.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff B Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff B Alternative crosses the Burnt River (Link 3-92), Dixie Creek (Link 3-92), Durkee Creek (Link 3-58), Manning Creek (Link 3-78), Pritchard Creek (Link 3-58), Sisley Creek (Link 3-82), and Unity Creek (Link 3-58), which support redband trout.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff B Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative generally parallels the southern side of the Flagstaff B Alternative for the northern half of its alignment, then diverts south in the area of Durkee and continues south to Weatherby.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Flagstaff B - Burnt River West Alternative crosses Alder Creek (Link 3-60), the Burnt River (Link 3-71), Dixie Creek (Link 3-73), and Powell Creek (Link 3-73), which support redband trout. The Flagstaff B – Burnt River West Alternative crosses three fewer streams which support redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Flagstaff B – Durkee Alternative

The Flagstaff B – Durkee Alternative generally parallels the southern side of the Flagstaff B – Burnt River Mountain Alternative for the northern half of its alignment, then diverts south and away from the Flagstaff B – Burnt Mountain Alternative southwest of Durkee.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Flagstaff B – Durkee Alternative crosses Alder Creek (Link 3-60), the Burnt River (Link 3-74), Dixie Creek (Link 3-90), North Fork Dixie Creek (twice) (Link 3-74 and 3-90), and unnamed streams (1174727444702 [Link 3-90] and 1174799444659 [Link 3-90]), which support redband trout. The Flagstaff B – Durkee Alternative crosses the similar number of waterways which support redband trout as the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

SEGMENT 4—BROGAN

Segment 4 begins in the Burnt River subbasin in the north, crosses through the Brownlee Reservoir subbasin and routes to the southwest through the Willow subbasin, ending in the Bully subbasin. Streams in this Segment drain generally toward the Snake River to the east – southeast.

Table 3-209 presents the resource inventory for fish resources crossed by all alternative route and route variation centerlines in Segment 4.

Table 3-209. Fish Resources Inventory Data for Segment 4—Brogan

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)				
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0	1.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*
Tub Mountain South	40.5	0.0	0.0	0.0	0.0	1.5
Willow Creek	34.6	0.0	0.0	0.0	0.0	0.9

Table 3-210 summarizes fish presence in streams crossed by all alternative route and route variation centerlines in Segment 4.

Table 3-210. Fish Presence in Segment 4—Brogan

Alternative Route	Length (miles)	Streams Crossed	Resource Inventory (miles)
Applicant's Proposed Action	40.1	Willow Creek	Redband trout
Variation S4-A1	*5.9*	*Goodman Creek*	*Redband trout*
Variation S4-A2	*6.0*	*Goodman Creek*	*Redband trout*
Variation S4-A3	*6.1*	*Goodman Creek*	*Redband trout*
Tub Mountain South	40.5	Goodman Creek	Redband trout
		Birch Creek	Redband trout
		Benson Creek	Redband trout
		Durbin Creek	Redband trout
		Willow Creek	Redband trout
Willow Creek	34.6	Goodman Creek	Redband trout
		Birch Creek	Redband trout
		Benson Creek	Redband trout
		Durbin Creek	Redband trout
		Willow Creek	Redband trout

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative and the Willow Creek Alternative begins at Dixie Creek in the Burnt River subbasin and proceeds south between Table Rock and the Burnt River valley.

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses Willow Creek (Link 4-65), which supports redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S4-A1

The variations in this series include Variation S4-A1 through S4-A3. Variation S4-A1 would generally parallel the Applicant's Proposed Action Alternative for its alignment, however taking a more western route than Variations S4-A2 and S4-A3.

Federally Listed and Candidate Fish Species

As with Variations S4-A2 and S4-A3, this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S4-A1 crosses Goodman Creek (Link 4-13), which supports redband trout. All variations in this series cross only Goodman Creek.

Protected Fish Habitats

As with Variations S4-A2 and S4-A3, this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S4-A2

Variation S4-A2 would generally parallel the Applicant's Proposed Action Alternative for its alignment, however taking a more eastern route than Variations S4-A1 and S4-A3.

Federally Listed and Candidate Fish Species

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S4-A2 crosses Goodman Creek (Link 4-17), which supports redband trout. All variations in this series cross Goodman Creek.

Protected Fish Habitats

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S4-A3

Variation S4-A3 would generally parallel the Applicant's Proposed Action Alternative for its alignment, this alignment would be located between Variations S4-A1 and S4-A2.

Federally Listed and Candidate Fish Species

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S4-A3 crosses Goodman Creek (Link 4-17), which supports redband trout. All variations in this series cross only Goodman Creek.

Protected Fish Habitats

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Tub Mountain South Alternative

The Tub Mountain South Alternative would generally parallel the Applicant's Proposed Action Alternative for its alignment south to Tub Mountain, then continue to the south and east toward the Snake River. The Tub Mountain South Alternative curves south past Love Reservoir and back west into Alkali Flats and ends at the Coyote Springs.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Tub Mountain South Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Tub Mountain South Alternative crosses Goodman Creek (Link 4-17), Birch Creek (Link 4-75), Benson Creek (Link 4-30), Durbin Creek (Link 4-30), and Willow Creek (Link 4-75), which support redband trout. The Tub Mountain South Alternative crosses four more streams than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Tub Mountain South Alternative does not cross any streams that support sensitive fish species. No identifiable impacts from this alternative are anticipated.

Willow Creek Alternative

The Willow Creek Alternative would generally parallel the Applicant's Proposed Action Alternative for its alignment south to Lost Tom Mountain, then continue to the south to Striped Mountain, then curve back west across the Willow Creek Valley and turns south toward Coyote Springs.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Willow Creek Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Willow Creek Alternative crosses Goodman Creek (Link 4-13), Birch Creek (Link 4-40), Benson Creek (Link 4-35), Durbin Creek (Link 4-35), and Willow Creek (Link 4-60), which support redband trout. The Willow Creek Alternative crosses four more streams than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Willow Creek Alternative does not cross any streams that support sensitive fish species. No identifiable impacts from this alternative are anticipated.

SEGMENT 5—MALHEUR

Segment 5 begins in the Bully River subbasin near Coyote Springs and proceeds south across Cottonwood Creek and Bully Creek, both headwaters areas to the Bully Creek Reservoir. Segment 5 continues south, crossing into the Lower Malheur subbasin, crossing Lower Malheur Canyon and the Malheur River. In the area of Vine Hill, the Applicant's Proposed Action Alternative turns east and cross the upper Cow Hollow, then turns south into the Lower Owyhee subbasin and crosses the Owyhee River near Mitchell Butte. The Applicant's Proposed Action Alternative continues south southeast

toward the Segment terminus near Succor Creek. Streams in this Segment drain generally toward the Snake River to the east.

Table 3-211 presents the resource inventory for fish resources crossed by all alternative route and route variation centerlines in Segment 5.

Table 3-211. Fish Resources Inventory Data for Segment 5—Malheur

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)				
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams
Applicant's Proposed Action	40.4	0.0	0.0	0.0	0.0	1.1
Variation S5-A1	7.4	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	7.4	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	2.5	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*
Variation S5-B2	2.8	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*
Malheur S	43.5	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*
Malheur A	43.1	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*

Table 3-212 summarizes fish presence in streams crossed by all alternative route and route variation centerlines in Segment 5.

Table 3-212. Fish Presence in Segment 5—Malheur

Alternative Route	Total Length (miles)	Streams Crossed	Fish Presence
Applicant's Proposed Action	40.4	Owyhee River	Redband trout
		Bully Creek	Redband trout
		Cottonwood Creek	Redband trout
		Malheur River	Redband trout
Variation S5-A1	*7.4*	*None*	*None*
Variation S5-A2	*7.4*	*None*	*None*
Variation S5-B1	*2.5*	*Owyhee River*	*Redband trout*
Variation S5-B2	*2.8*	*Owyhee River*	*Redband trout*
Malheur S	43.5	Owyhee River	Redband trout
		Bully Creek	Redband trout
		Cottonwood Creek	Redband trout
		Malheur River	Redband trout
Malheur A	43.1	Owyhee River	Redband trout
		Bully Creek	Redband trout
		Cottonwood Creek	Redband trout
		Malheur River	Redband trout

Applicant's Proposed Action Alternative

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses the Owyhee River (Link 5-55), Bully Creek (Link 5-1), Cottonwood Creek (Link 5-1), and the Malheur River (Link 5-5), which support redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S5-A1

The variations in this series include Variation S5-A1 and S5-A2. Variation S5-A1 would generally parallel the Applicant's Proposed Action Alternative for most of its alignment; however it takes a slightly northern route compared to Variation S5-A2.

Federally Listed and Candidate Fish Species

Variation S5-A1, as with Variation S5-A2, does not cross any streams or other fish resources. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S5-A1, as with Variation S5-A2, does not cross any streams or other fish resources. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

Variation S5-A1, as with Variation S5-A2, does not cross any streams or other fish resources. No identifiable impacts from this variation are anticipated.

Variation S5-A2

Variation S5-A2 would generally parallel the Applicant's Proposed Action Alternative for most of its alignment; however it takes a slightly southern route compared to Variation S5-A1.

Federally Listed and Candidate Fish Species

As with Variation S5-A1, Variation S5-A2 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S5-A1, Variation S5-A2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with Variation S5-A1, Variation S5-A2 does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Variation S5-B1

The variations in this series include Variation S5-B1 and S5-B2. Variation S5-B1 would generally parallel the Applicant's Proposed Action Alternative near the Owyhee River; however it takes a slightly southern route compared to Variation S5-B2.

Federally Listed and Candidate Fish Species

Variation S5-B1, as with Variation S5-B2, does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S5-B1, similar to Variation S5-B2, crosses the Owyhee River (Link 5-55), which supports redband trout.

Protected Fish Habitats

Variation S5-B1, as with Variation S5-B2, does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S5-B2

Variation S5-B2 would generally parallel the Applicant's Proposed Action Alternative for most of its alignment; however it takes a slightly more northern route across the Owyhee River compared to Variation S5-B1.

Federally Listed and Candidate Fish Species

As with Variation S5-B1, Variation S5-B2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Similar to Variation S5-B1, Variation S5-B2 crosses the Owyhee River (Link 5-45), which supports redband trout.

Protected Fish Habitats

As with Variation S5-B1, Variation S5-B2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Malheur S Alternative

The Malheur S Alternative would generally parallel the Applicant's Proposed Action Alternative until crossing U.S. Route 20 west of Vale, Oregon; the Malheur S Alternative then veers south, generally paralleling the Malheur A Alternative for most of its length until reaching Government Corral Spring, then the Malheur S Alternative runs generally east and south to its terminus near Succor Creek.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Malheur S Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

As with the Applicant's Proposed Action Alternative, the Malheur S Alternative crosses the Owyhee River (Link 5-30), Bully Creek (Link 5-1), Cottonwood Creek (Link 5-1), and the Malheur River (Link 5-5), which support redband trout.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Malheur S Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Malheur A Alternative

The Malheur A Alternative would generally parallel the Applicant's Proposed Action Alternative until crossing U.S. Route 20 west of Vale, Oregon; the Malheur A Alternative then veers south, generally paralleling the Malheur S Alternative for most of its length until reaching Government Corral Spring, then the Malheur A Alternative runs generally south then east to its terminus near Succor Creek.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Malheur A Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

As with the Applicant's Proposed Action Alternative, the Malheur A Alternative crosses the Owyhee River (Link 5-35), Bully Creek (Link 5-1), Cottonwood Creek (Link 5-1), and the Malheur River (Link 5-5), which support redband trout.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Malheur A Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

SEGMENT 6—TREASURE VALLEY

The Treasure Valley Segment is located entirely in Owyhee County, Idaho, and includes the Proposed Action from the Oregon/Idaho border to the Project's terminus at the Hemingway Substation.

Table 3-213 presents the resource inventory for fish resources crossed by all alternative route and route variation centerlines in Segment 6.

Table 3-213. Fish Resources Inventory Data for Segment 6—Treasure Valley						
Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)				
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams
Applicant's Proposed Action	28.0	0.0	0.0	0.0	0.0	0.8
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*

Table 3-214 summarizes fish presence in streams crossed by all alternative route and route variation centerlines in Segment 6.

Table 3-214. Fish Presence in Segment 6—Treasure Valley			
Alternative Route	Total Length (miles)	Streams Crossed	Fish Presence
Applicant's Proposed Action	28.0	Succor Creek	Redband trout
		Reynolds Creek	Redband trout
		Jump Creek	Redband trout
Variation S6-A1	*9.3*	*Poison Creek*	*Redband trout*
Variation S6-A2	*8.9*	*Poison Creek*	*Redband trout*
Variation S6-B1	*14.4*	*Jump Creek*	*Redband trout*
Variation S6-B2	*14.1*	*Jump Creek*	*Redband trout*

Applicant's Proposed Action Alternative

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses Succor Creek (Link 6-1), Reynolds Creek, and Jump Creek (Link 6-25), which support redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S6-A1

The variations in this series include Variation S6-A1 and S6-A2. Variation S6-A1 would generally parallel the Applicant's Proposed Action Alternative for most of its alignment; however it deviates slightly to the south of Variation S6-A2.

Federally Listed and Candidate Fish Species

Variation S6-A1, as with Variation S6-A2, does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S6-A1 crosses Poison Creek (Link 6-20), which supports redband trout. Both Variation S6-A1 and S6-A2 cross Poison Creek.

Protected Fish Habitats

Variation S6-A1, as with Variation S6-A2, does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S6-A2

Variation S6-A2 would generally parallel the Applicant's Proposed Action Alternative for most of its alignment; however it deviates slightly to the north of Variation S6-A1.

Federally Listed and Candidate Fish Species

As with Variation S6-A1, Variation S6-A2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S6-A2 crosses Poison Creek (Link 6-15), which supports redband trout. Both Variation S6-A2 and S6-A1 cross Poison Creek.

Protected Fish Habitats

As with Variation S6-A1, Variation S6-A2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S6-B1

The variations in this series include Variation S6-B1 and S6-B2. Variation S6-B1 would generally parallel the Applicant's Proposed Action Alternative for most of its alignment; however it deviates slightly to the north of Variation S6-B2.

Federally Listed and Candidate Fish Species

Variation S6-B1, as with Variation S6-B2, does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S6-B1, similar to Variation S6-B2, crosses Jump Creek (Link 6-25), which supports redband trout.

Protected Fish Habitats

As with Variation S6-B2, Variation S6-B1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S6-B2

Variation S6-B2 would generally parallel the Applicant's Proposed Action Alternative for most of its alignment; however it deviates slightly to the south of Variation S6-B1.

Federally Listed and Candidate Fish Species

As with Variation S6-B1, Variation S6-B2 does not cross any stream which support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S6-B1, Variation S6-B2 crosses Jump Creek (Link 6-30), which supports redband trout.

Protected Fish Habitats

As with Variation S6-B1, Variation S6-B2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

3.2.5.6 Environmental Consequences (Results of Analysis)

Types of Potential Effects

Most direct and indirect effects on fish and aquatic resources from the B2H Project would result from three major B2H Project-related activities: construction and use of stream-crossing access roads, management of riparian and forest vegetation, and ground-disturbing activities and other B2H Project activities in proximity to waterbodies.

Access Roads

In general, the analysis area (study corridor) used for the assessment of fish resources consists of fish-bearing streams crossed by the centerline of alternative routes and route variations. No specific access road stream crossings are used as part of this analysis. However, streams directly crossed by access roads have the greatest potential to be affected by B2H Project activities. Direct effects on fish could include fish mortality during construction of access roads if fish are present at the time in-stream activities to construct stream crossings are conducted. However, no in-water work, or work below the ordinary high water mark (OHW), is anticipated to occur in streams that support ESA-listed fish, designated critical habitat, and/or EFH.

Direct effects also would include short-term loss of aquatic habitat or a reduction in overall habitat quality through an increase of erosion and sedimentation and removal of vegetation as a result of construction of access roads or transmission structures in aquatic habitats. The major potential direct effects on fish resources from stream crossings are a short-term downstream increase in suspended sediment and turbidity resulting in the potential for fish impedance. Increased sedimentation is likely to result in reduced egg-to-fry survival (NMFS 2015). Fine sediment fills the interstitial spaces of spawning substrate, which results in a decrease in flow over the eggs that normally would provide oxygen to the eggs and carry away metabolic waste (NMFS 2015).

Impacts from increased erosion and sediment transport from upland locations during construction would be limited to the area of construction and approximately 300 feet downstream[2] of construction and would be short term during construction activities.

New crossings of waterbodies will be avoided to the extent practicable by using existing crossings, but some new crossings are expected. No new access road crossings, or modifications of existing crossings below OHW, will occur in waterways that support ESA-listed fish, designated critical habitat, and/or EFH. Furthermore, no new crossings, or modifications of existing crossings below OHW, will occur within 1,000 feet upstream of waterways, including tributaries that support ESA-listed fish, designated critical habitat, and/or EFH.

For perennial fish-bearing waterways that do not support ESA-listed fish, designated critical habitat, and/or EFH, existing structures will be used when feasible; however, new or modified channel-spanning structures may be used where required. All proposed channel spanning structure designs or modifications developed for fish-bearing streams meet Oregon Fish Passage criteria outlined in OAR Division 412 and will be implemented with approval by ODFW. For seasonal/ephemeral streams, new or modified channel-spanning structures, existing fords, or existing fords that require minor modifications to stabilize (e.g., portable mats, minimal amount of coarse fill) will be used.

Furthermore, no new culverts will be installed and no existing culverts will be replaced as part of the Project.

As the engineering plans are further developed for access roads, site-specific crossings would be designed and other crossing types may be used. Locations where access roads cross streams (perennial, intermittent, or ephemeral) that have historic or current populations of native migratory fish (OAR 635-412-0005(32)) state and federal fish passage rules and regulations would be addressed and final crossing plans would be determined through consultation with federal and state agencies, as requested. Based on determinations by federal and state agencies regarding presence of migratory fish species and passage needs at specific stream crossings, fish passage plans would be developed for streams that trigger state or federal fish passage laws.

Because it is anticipated that some fish-bearing streams would require in-water work, or work below OHW, structures may impede natural large woody debris, water, or sediment movement. However, crossing types would be specified by jurisdictional agencies at the time of final engineering design, and crossings of fish-bearing streams would be designed to allow natural flow, fish passage, and to reduce downstream sediment disturbance and bank erosion during use of the road for B2H Project operations. Furthermore, all disturbed sites will be stabilized in accordance with National Pollutant Discharge Elimination System standards.

The crossing types currently planned for use are detailed in the Revised POD and are summarized in Chapter 2.

[2]300 feet is based on the Department of Environmental Quality Technical Basis for Revising Turbidity Criteria (2005).

Non-fish-bearing seasonal waterways would be crossed when water is not flowing in the channels and applicable design features and selective mitigation measures would be followed.

Vegetation Removal

Removal of riparian vegetation could result in increases in water temperature and have effects on fish habitat. In general, higher water temperatures decrease dissolved oxygen and can stress fish. Impacts associated with the removal of streamside vegetation would range from short to long term, depending on whether the vegetation removal would be short term for construction or long term for operations.

Vegetation removal within riparian areas (Refer to RCAs in Section 3.2.3) generally would occur in the right-of-way (wire zone and border zone) and on access roads. A majority of the trees within the wire zone would be permanently removed except for low-growing trees and shrubs as well as trees within valley bottoms. After initial clearing, vegetation in the wire zone would be maintained to consist of native grasses, legumes, herbs, ferns, and other low-growing shrubs that remain under 20 to 25 feet tall at maturity. Vegetation in the border zone would be maintained to consist of tall shrubs or short trees (up to 34 feet high at maturity), grasses, and forbs. Additionally, the cleared areas would be replanted, where practicable, with a variety of native species, helping to restore vegetation communities. Therefore, minimal impacts on organic input and large wood recruitment are anticipated.

Long-term loss of vegetation and trees near streams and on the right-of-way may cause an increase in solar exposure and slight localized increase in surface water temperature because stream temperature in vegetated riparian settings can be influenced strongly by the presence or absence of shade (Danehy et al. 2005). Water temperature impacts would be greatest along waterbodies that are small, slow-moving and shallow. Thinning or removal of vegetation within or adjacent to riparian areas also could contribute to long-term local increases in sedimentation.

The majority of stream crossings for the B2H Project would occur in shrublands, outside of forested areas. Shrub canopy cover typically is concentrated along the edges of a stream. Overhead sun imparts maximum solar radiation directly onto the deeper middle portions of the stream.

Indirect effects from vegetation removal as a result of road construction may include the potential to add sediment and turbidity to streams that are not crossed directly. Although the level of effect would be less than from direct road-stream crossings, construction activities on these nearby roads and facilities still could contribute sediment to streams.

New road construction would have a higher likelihood of creating sediment runoff to streams, and at greater levels, than would the upgrading of existing roads, given the much lower ground disturbance involved in the latter. Operations and maintenance activities near fish-bearing streams would be infrequent (approximately one time per year) and limited to the specific areas of maintenance activity.

Special Status Species

Direct effects on federally listed fish species and other sensitive fish species would be similar to those effects described above for all other fish species.

Direct effects would be similar for all of the special status species that occur in the study area and would include displacement, disruption of habitats, and increased sedimentation which could modify fish behavior, including decreasing the ability to avoid predators (NMFS 2015). Indirect effects on special status fish species associated with the B2H Project would be limited in extent and magnitude. Indirect effects could include potential temporary increases in turbidity and sedimentation associated with operation and maintenance activities near fish-bearing streams.

Protected Fish Habitats

Critical habitat is identified by the NOAA Fisheries and the USFWS for many Federal ESA threatened and endangered fish species and is designated for several fish species in the B2H Project area. EFH is designated under the MSA for commercial Pacific salmon species, including for Chinook salmon and coho salmon within the B2H Project area. Direct effects on critical habitat and salmon EFH would include physical, chemical, or biological alterations of the waters or substrate and other ecosystem components, if such alterations reduce the quality or quantity of the habitat (50 CFR 600.810).

No in-water work is anticipated within designated critical habitat or EFH-designated streams; however, in-water work may be required in fish-bearing habitats that do not support ESA-listed fish species but do support USFS, BLM, or state special status fish species. Components of the B2H Project with the potential to adversely affect designated critical habitat, EFH, and habitats that support BLM, USFS, or state special status species include the removal of terrestrial and riparian vegetation, construction and operation of new access roads, the upgrade of existing access roads, and risk of accidental spills and leaks of hazardous materials.

Construction activities occurring for new access roads, upgrade of existing access roads, or other structures directly would affect habitats that support special status species as well as designated critical habitat and salmon EFH by temporarily increasing sedimentation and temporarily decreasing natural cover and availability of forage. These impacts would be localized to the areas of construction activity and would be short term for the duration of B2H Project construction. Also, in-water work, or work below OHW, will adhere to Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources (ODFW 2008).

Indirect effects on critical habitat, EFH, and habitats that support special status species would include temporary increases in turbidity and sedimentation associated with long-term periodic operation and maintenance activities near these designated streams.

Direct and indirect impacts from increases in turbidity and sediment will be minimized with the implementation of design features of the B2H Project for environmental protection and selective mitigation measures outlined in the Effects Analysis - Assessment of Initial Impacts section below

The information presented here is a summary of effects on the watersheds that the B2H Project would cross. Watershed road density is an indicator used by the NOAA Fisheries and the USFWS in the evaluation of watershed condition. The condition of a watershed is one of several metrics used to evaluate fish habitat condition. The NMFS (1996) has defined three classes of watershed condition:

- "properly functioning" (road density of less than 2 miles per square mile)
- "at risk" (road density from 2 to 3 miles per square mile), and
- "not properly functioning" (road density greater than 3 miles per square mile)

Higher road density often is correlated with increased peak stream flows and increased sediment to streams, both considered adverse conditions for fish. Peak flow, for example, can cause accelerated bank erosion; excessively scour stream bottoms, including spawning redds; disturb benthic organisms that are important food sources for fish; or wash out in-stream structures, such as large wood, that supply important stream habitat components.

The average existing road density across all 105 subwatersheds is 1.6 miles per square mile. The density range among the subwatersheds ranges from 0.5 to 5.7 miles per square mile. As described in Section 2.3.4.1, existing roads would be used in their present condition without improvements to the extent possible; however, new access roads (including new primitive roads or new bladed roads) would be constructed for the B2H Project. New access roads would result in increased road densities, but since the B2H Project facilities have not been fully designed and locations of the transmission line access roads are not known, increases in road densities for each subwatershed cannot be calculated. For the purpose of estimating impacts, ground disturbance associated with upgrading existing roads or constructing new roads was predicted through the development of a model based on the typical design characteristics of the 500-kV transmission line and ancillary facilities (Section 2.5.1). Estimated ground disturbance from access road per mile of transmission line is presented in Table 2-7. Increases in road densities in the subwatersheds crossed by the B2H Project could be moved into a category of greater risk to fish resources from possible increased flow and sedimentation.

Some increase in peak runoff and sedimentation may occur in these subwatersheds, but with relatively few miles added per subwatershed, the effects should be minimal. The effects from the B2H Project on spawning and rearing habitat in streams in these basins resulting from the road contribution would be slight. Similar effects are anticipated from the alternatives.

In summary, some relative increase in risk categorization to subwatershed conditions would occur. The increase in risk to watershed conditions should be slight because the number of new road miles added by the proposed B2H Project would be relatively low.

Habitat Removal

No in-water work is anticipated within waterways that support ESA-listed fish species, designated critical habitat, and/or EFH-designated streams; therefore, impacts on these in-stream habitats from construction would be minimal. However, in-water work may be required within fish-bearing waterways that do not support ESA-listed fish species but do support USFS, BLM, or state special status fish species.

Vegetation removal within riparian areas generally would occur in the right-of-way (wire zone and border zone) and on access roads. A majority of the trees in the wire zone would be removed except for low-growing trees and shrubs as well as trees in valley bottoms. After initial clearing, vegetation in

the wire zone would be maintained to consist of native grasses, legumes, herbs, ferns, and other low-growing shrubs that remain under 20 to 25 feet tall at maturity. Vegetation in the border zone would be maintained to consist of tall shrubs or short trees (up to 34 feet high at maturity), grasses, and forbs. Additionally, the cleared areas would be replanted, where practicable, with a variety of native species, helping to restore vegetation communities.

Water Withdrawal

Much of the water that would be used during construction activities would be used for dust suppression on access roads and to mix concrete for foundations. Water to be used during construction would be procured from municipal or commercial sources; therefore, so surface water withdrawals would be required. Because no new water rights would be required; impacts on fish from water withdrawal is not anticipated.

Noise

No in-water work is anticipated within waterways that support ESA-listed fish species, designated critical habitat, and/or EFH; therefore, impacts on listed species from construction noise would be minimal to ESA-listed fish species. However, in-water work may occur in waterways that support USFS, BLM, or state special status species.

To minimize impacts on fish from noise, all in-water work will occur during seasonal restrictions based on Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources (ODFW 2008).

Blasting

Implosive splicing and in-ground blasting is anticipated to occur during the B2H Project. The detonation of explosives in or near a body of water produces post-detonation compressive shock waves characterized by a rapid rise to a high peak pressure, followed by a rapid decay to a below-ambient hydrostatic pressure. Such a rapid pressure change may induce serious barotraumas to fish if blasting does not occur a sufficient distance from a body of water (the “setback” distance) (NMFS 2011). The range of charges for ground blasting will vary greatly with type, depth, strength and other physical properties of the rock to be blasted; therefore, without known locations of potential blasting, and geotechnical or foundation design data, specific information regarding ground blasting will not be available until construction begins. However, direct effects from blasting are anticipated to be reduced with the implementation of design features of the B2H Project for environmental protection and selective mitigation measures, such as seasonal restrictions and buffer distances, as described in the Effects Analysis - Assessment of Initial Impacts section below. Therefore, a B2H Project-specific blasting plan, for blasting and implosive splicing, that meets all state and federal requirements, including seasonal restrictions and buffer distances, would be developed and approved by the appropriate agency or agencies (e.g., the BLM, USFS, USFWS, and the NOAA Fisheries) for inclusion in the POD, prior to the start of field activities and would be executed appropriately for the B2H Project. No in-water blasting would occur as part of the B2H Project.

Noxious Weeds/Herbicides

The Applicant is responsible for ensuring that noxious weeds are identified and controlled during construction, operation, and maintenance of B2H Project facilities and that all federal, state, county, and other local requirements are satisfied. The management of noxious weeds would be considered throughout all stages of the B2H Project. Construction personnel would be educated regarding identified problem areas, the importance of preventive measures, and treatment methods. Specific preventive measures would be implemented to counteract the spread of noxious weeds during construction, operation, and maintenance activities. Preconstruction and postconstruction treatment methods would be applied to areas where noxious weeds are present. Noxious weed control typically would employ herbicide application and all noxious-weed-control activities would follow applicable BLM or USFS guidelines on federally managed lands. Additional measures to reduce the spread of noxious weeds, including avoidance, topsoil separation, and vehicle washing, would be followed as established in the Reclamation, Revegetation, and Monitoring Framework Plan.

Herbicide use during construction and operation of the B2H Project may cause short-term reduction in water quality due to herbicide drift and runoff. If not managed properly, herbicide use may result in direct impacts on fish by modifying fish behavior, including decreasing the ability of predator avoidance (NMFS 2015). In areas where federally listed and special status fish species are present, noxious-weed-control methods, approved herbicides, and buffers would be implemented, as described in the Effects Analysis - Assessment of Initial Impacts section below. Therefore, with the implementation of the Applicant's Noxious Weed Management Plan and Water Resources Protection Plan (to be included in the POD), the probability of direct impacts on fish is anticipated to be minimal.

Predator/Prey Relationships

Altered predator/prey relationships may result from increased sediment into waterways and removal of riparian vegetation. Impacts on water quality, such as an increase in turbidity and fine sediment, can alter predator/prey relationships by reducing the ability of predator avoidance and success in catching prey (NMFS 2015). Also, removal of riparian vegetation may decrease cover for juvenile fish, which may result in an increase in avian predation.

Fugitive Dust and Sedimentation

Fugitive dust resulting from construction activities and use of B2H Project access roads could result in indirect effects on fish resources in the form of increased turbidity to streams.

Dust production is expected only during construction activities and use of access roads that have not yet revegetated; operation and regular maintenance of the transmission line are not expected to produce an appreciable amount of dust or turbidity in streams.

As part of the B2H Project and several conservation measures are proposed that will minimize the potential for sediment transport from upland areas. Also, salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such seasonal high pulse exposures (NMFS 2012). Therefore, the increases in suspended sediment and turbidity plumes resulting from B2H Project-

related activities are not likely to kill or injure salmonids or other sensitive fish but may impede adult passage and juvenile rearing, as fish would avoid the area for the duration of the impact (NMFS 2012). As previously stated, several conservation measures are proposed that would minimize the potential for excessive B2H Project-related turbidity and impacts on fish in the B2H Project area.

Release of Pollutants

Accidental release of fuel, oil, and other contaminants may occur during construction and maintenance of the B2H Project. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain polycyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and also can cause chronic lethal, and acute and chronic sublethal, effects on aquatic organisms (NMFS 2012). Development and implementation of a Spill Prevention, Containment, and Countermeasures Plan and a Hazardous Materials Management Plan (to be included in the POD), would include containment measures for construction-related chemical hazards and would reduce the likelihood for chemical releases during the B2H Project. In addition, construction specifications would require proper placement, containment, and use of harmful materials within the B2H Project area to minimize accidental discharge of these materials.

Design features of the B2H Project for environmental protection and selective mitigation measures developed to minimize the accidental discharge of pollutants to waterways are described in the Effects Analysis - Assessment of Initial Impacts section below.

DIRECT AND INDIRECT IMPACTS

The analysis of impacts on fish and other aquatic species considered what the B2H Project construction and operations activities would be based on the B2H Project description (refer to Chapter 2) and impacts presented for similar projects and actions in the literature. This analysis considered the nature of the affected waterbodies; likely in-stream disturbances and nearby ground-disturbing activities due to the Project footprint, including access roads; types of affected vegetation and quantity of cleared riparian areas, proposed right-of-way maintenance methods, proposed stream crossing methods, and the design features and selective mitigation measures that would be implemented to reduce disturbance to fish resources.

Tables 3-204, 3-206, 3-208, 3-210, 3-212, and 3-214 indicate known fish species where present at a transmission line crossing and those within 1,000 feet downstream of a crossing. While some other fish species may be present in some of these streams, specific species designations are not indicated in the ODFW or StreamNet databases. A final site assessment and final engineering design of each access road-stream crossing would be conducted prior to construction to identify the fish species present and the appropriate design features and selective mitigation measures to apply to reduce and avoid impacts. This assessment would include consideration of site-specific conditions which may indicate the need for maintaining and/or improving passage for native migratory fish at some proposed road crossings of fish-bearing intermittent streams.

TRADITIONAL FOODS

Restricted access to harvest areas, poor water quality, and a depletion of resources, such as water and salmon, can adversely affect tribal communities. The B2H Project could temporarily restrict tribal access to traditional harvest areas during construction, but access would not be restricted long-term. Availability of fish resources would not be affected by the B2H Project. The following temporary impacts on water and fish may occur:

The Project may affect water by:

- transport of sediment to waterways from upland locations (construction of new access roads and vegetation clearing)

The Project may affect fish by:

- temporarily increasing turbidity above baseline levels as a result of sediment transport from upland locations (construction of new access roads and vegetation clearing), potentially resulting in behavioral harassment
- altering predator-prey relationships as a result of sediment transport into waterways from upland locations and temporary removal of riparian vegetation

The Project is not anticipated to:

- restrict tribal access to harvest areas
- decrease water quantity, as no new water rights will be required
- kill fish, as fish removal from in-water work areas will occur where needed
- block fish from migrating to/from harvest areas, as fish-passage criteria will be followed where required

Conservation measures to reduce negative effects on water and fish include design features of the B2H Project for environmental protection and selective mitigation measures that are applied to mitigate site- and/or resource-specific impacts of the B2H Project (Refer to Section 3.2.5.4). As a result, impacts on traditional fish foods are anticipated to be minimal.

NO ACTION ALTERNATIVE

Under the No Action alternative, the proposed B2H Project would not be approved by the BLM or USFS and the impacts associated with the B2H Project would not occur. As such, there would be no direct or indirect impacts on fish or aquatic habitats.

SEGMENT 1—MORROW-UMATILLA

The alternatives in Segment 1 cross between 6 and 11 waterways with fish presence, construct new access roads, remove riparian vegetation, and control noxious weeds through herbicide use.

The number or location of access road crossings will not be available until a route is selected for construction and final design and engineering is completed. However, the construction of new access

roads and the upgrades of existing access roads can cause the loss of streamside vegetation, increased sedimentation or pollution runoff to waterways, potential blockage of fish passage, and loss of necessary habitat over the life of the B2H Project.

In Segment 1, no new access road crossings, or modifications of existing road crossings below OHW, would occur in waterways that support ESA-listed fish, designated critical habitat, and/or EFH. Furthermore, no new crossings, or modifications of existing crossings below OHW, would occur within 1,000 feet upstream of waterways, including tributaries that support ESA-listed fish, designated critical habitat, and/or EFH.

For perennial fish-bearing waterways that do not support ESA-listed species, designated critical habitat, and/or EFH, existing structures would be used when feasible; however, new or modified channel-spanning structures may be used where required. All proposed channel spanning structure designs or modifications for fish-bearing streams would be implemented with approval by ODFW. For seasonal/ephemeral streams, new or modified channel-spanning structures, existing fords, or existing fords that require minor modifications to stabilize (e.g., portable mats, minimal amount of coarse fill) would be used. Fords would not be created within waterways that support ESA-listed species, designated critical habitat, and/or EFH, or within tributaries 1,000 feet upstream of these areas.

Also, no new access roads will be constructed in the RCA of a waterway that supports ESA-listed fish, designated critical habitat, and/or EFH. However, short segments of new access roads would be constructed within RCAs of waterways that do not support ESA-listed fish, designated critical habitat, and/or EFH.

Furthermore, no new culverts would be installed and no existing culverts would be replaced as part of the Project in Segment 1.

The differences in impacts on fish resources between the alternatives and variations within Segment 1 are mainly related to the number of stream crossings and the extent of vegetation removal that would be required. Table 3-215 presents the residual impacts on all alternative routes and route variations in Segment 1.

Table 3-215. Fish Resources Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)					Residual Impacts (miles crossed)		
		Bull Trout Critical Habitat	Chinook Salmon Essential Fish Habitat[1]	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams	None	Low	Moderate
Applicant's Proposed Action	91.9	0	0	0.1	0.1	1.6	90.3	1.4	0.2
Variation S1-B1	*6.4*	*0*	*0*	*0*	*0.1*	*0.1*	*6.3*	*0*	*0.1*
Variation S1-B2	*6.4*	*0*	*0*	*0*	*0.4*	*0.4*	*6*	*0*	*0.4*
East of Bombing Range Road	92.3	0	0	0.1	0.1	1.6	90.7	1.4	0.2
Applicant's Proposed Action – Southern Route	99.1	0	0	0.4	0.1	1.6	97.5	1.1	0.5
West of Bombing Range Road – Southern Route	95.6	0	0	0.7	0.1	2	93.6	1.2	0.8
Longhorn	88.2	0	0	0.1	0.1	1.6	86.6	1.4	0.2
Interstate 84	84.7	0.2	0.3	0.3	0.1	2	82.7	1.5	0.5
Variation S1-A1	*18.5*	*0.1*	*0.2*	*0.1*	*0*	*0.6*	*17.9*	*0.4*	*0.2*
Variation S1-A2	*18.5*	*0.2*	*0.2*	*0.2*	*0*	*0.3*	*18.2*	*0.1*	*0.2*
Interstate 84 – Southern Route	93.4	0.2	0.3	0.6	0.1	2	86.6	1.4	0.2

Table Note: Chinook salmon EFH is used as the surrogate for the EFH resource inventory.

Applicant's Proposed Action Alternative

This alternative crosses Butter Creek, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Birch Creek and Dry Creek support federally listed steelhead. The Birch Creek riparian area is approximately 200 feet wide at the line crossing. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in 0.1 mile of moderate residual impacts on MCR steelhead and SRB steelhead.

Sensitive Fish Species

Butter Creek, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 350 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 1.6 miles of low residual impacts on redband trout.

Protected Fish Habitats

Birch Creek and Dry Creek contain designated critical habitat for steelhead DPSs. Coho salmon and associated EFH is present within this segment of Birch Creek. The Birch Creek vegetated riparian area is approximately 200 feet wide at the line crossing. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 0.1 mile of moderate residual impacts on both MCR and SRB steelhead critical habitat and approximately 0.1 mile of coho EFH.

Variation S1-B1

This variation crosses Dry Creek. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Dry Creek supports federally listed SRB steelhead. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in 0.1 mile of moderate residual impacts on SRB steelhead.

Sensitive Fish Species

Dry Creek supports redband trout. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in approximately 0.1 mile of low residual impacts on redband trout.

Protected Fish Habitats

Dry Creek supports designated critical habitat for SRB steelhead. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing.

Variation S1-B2

This variation crosses Dry Creek and an unnamed stream formerly named California Gulch (LLID 1182983453761) near the confluence of the two streams. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and

sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Dry Creek and an unnamed stream formerly named California Gulch (LLID 1182983453761) near the confluence of the two streams support SRB steelhead. The Dry Creek/California Gulch riparian area is approximately 300 feet wide at the line crossing. This variation crosses one more stream inhabited by federally listed fish compared to the Applicant's Proposed Action Alternative, and is anticipated to result in approximately 0.4 mile of moderate residual impact on SRB steelhead.

Sensitive Fish Species

Dry Creek and an unnamed stream formerly named California Gulch (LLID 1182983453761) near the confluence of the two streams support redband trout. The Dry Creek/unnamed stream riparian area is approximately 300 feet wide at the line crossing. This variation crosses one more stream inhabited by sensitive fish compared to the Applicant's Proposed Action Alternative. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in approximately 0.1 mile of low residual impacts on redband trout.

Protected Fish Habitats

Dry Creek and an unnamed stream formerly named California Gulch (LLID 1182983453761) near the confluence of the two streams support designated critical habitat for SRB steelhead. The Dry Creek/unnamed stream riparian area is approximately 300 feet wide at the line crossing. This variation crosses one more stream inhabited by federally listed fish compared to the Applicant's Proposed Action Alternative. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in approximately 0.4 mile of moderate residual impacts on SRB steelhead critical habitat.

Additional Action – 69-Kilovolt Line Replacement

Federally Listed and Candidate Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Protected Fish Habitats

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

East of Bombing Range Road Alternative

This alternative crosses Butter Creek, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Birch Creek and Dry Creek support federally listed steelhead. The Birch Creek riparian area is approximately 200 feet wide at the line crossing. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in 0.1 mile of moderate residual impacts on MCR steelhead and SRB steelhead.

Sensitive Fish Species

Butter Creek, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 350 feet. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 1.6 miles of low residual impacts on redband trout.

Protected Fish Habitats

Birch Creek and Dry Creek support designated critical habitat for steelhead DPSs. Coho salmon and associated EFH is present within this segment of Birch Creek. The Birch Creek vegetated riparian area is approximately 200 feet wide at the line crossing. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 0.1 mile of moderate residual impacts on both MCR and SRB steelhead critical habitat and approximately 0.1 mile of coho EFH.

Applicant's Proposed Action – Southern Route Alternative

This alternative crosses Butter Creek, West Birch Creek, California Gulch, East Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

West Birch Creek, California Gulch, East Birch Creek, and Dry Creek support federally listed MCR steelhead. At the location of the crossings, the vegetated riparian width for West Birch Creek is approximately 120 feet, for California Gulch is approximately 50 feet, and for East Birch Creek is approximately 85 feet. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in 0.4 mile of moderate residual impacts on MCR steelhead and 0.1 mile of moderate residual impacts on SRB steelhead.

Sensitive Fish Species

Butter Creek, West Birch Creek, California Gulch, East Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 350 feet. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 1.6 miles of low residual impacts on redband trout.

Protected Fish Habitats

West Birch Creek, California Gulch, East Birch Creek, and Dry Creek support designated critical habitat for MCR steelhead. At the location of the crossings, the vegetated riparian width for West Birch Creek is approximately 120 feet, for California Gulch is approximately 50 feet, and for East Birch Creek is approximately 85 feet. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 0.4 mile of moderate residual impacts on MCR steelhead critical habitat and 0.1 mile of moderate residual impact on SRB steelhead critical habitat.

Additional Action – 69-Kilovolt Line Replacement

Federally Listed and Candidate Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Protected Fish Habitats

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

West of Bombing Range Road – Southern Route Alternative

This alternative crosses Little Butter Creek, Butter Creek three times, Bear Creek, West Birch Creek, California Gulch, East Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects

on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Bear Creek, West Birch Creek, California Gulch, East Birch Creek, and Dry Creek support federally listed MCR steelhead. At the location of the crossings, the vegetated riparian width for Bear Creek is approximately 25 feet wide, for West Birch Creek is approximately 75 feet, for California Gulch is approximately 50 feet, and for East Birch Creek is approximately 85 feet. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-201), this alternative is anticipated to result in 0.7 mile of moderate residual impacts on MCR steelhead and 0.1 mile of moderate residual impacts on SRB steelhead.

Sensitive Fish Species

This alternative crosses Butter Creek, Butter Creek three times. Bear Creek, West Birch Creek, California Gulch, East Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 350 feet. Based on the impact criteria used in this analysis (Table 3-201), this alternative is anticipated to result in approximately 2.0 miles of low residual impacts on redband trout.

Protected Fish Habitats

Bear Creek, West Birch Creek, California Gulch, East Birch Creek and Dry Creek support designated critical habitat for MCR steelhead. At the location of the crossings, the vegetated riparian width for Bear Creek is approximately 25 feet wide, for West Birch Creek is approximately 75 feet, for California Gulch is approximately 50 feet, and for East Birch Creek is approximately 85 feet. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-201), this alternative is anticipated to result in approximately 0.7 mile of moderate residual impacts on MCR steelhead critical habitat and 0.1 mile of moderate residual impact on SRB steelhead critical habitat.

Additional Action – 69-Kilovolt Line Replacement

Federally Listed and Candidate Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Protected Fish Habitats

Design Options 1, 2, and 3 do not cross any streams or other fish resources. No identifiable impacts from this action are anticipated.

Longhorn Alternative

This alternative crosses Butter Creek, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Birch Creek and Dry Creek support federally listed steelhead. The Birch Creek riparian area is approximately 200 feet wide at the line crossing. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in 0.1 mile of moderate residual impacts on MCR steelhead and SRB steelhead.

Sensitive Fish Species

Butter Creek, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 350 feet. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 1.6 miles of low residual impacts on redband trout.

Protected Fish Habitats

Birch Creek and Dry Creek support designated critical habitat for steelhead DPSs. Coho salmon and associated EFH is present within this segment of Birch Creek. The Birch Creek vegetated riparian area is approximately 200 feet wide at the line crossing. The Dry Creek vegetated riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 0.1 mile of moderate residual impacts on both MCR and SRB steelhead critical habitat and approximately 0.1 mile of coho EFH.

Interstate 84 Alternative

This alternative crosses Butter Creek, the Umatilla River twice, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and

water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Umatilla River, Birch Creek, and Dry Creek support federally listed MCR steelhead. The Umatilla River also supports federally listed bull trout. The vegetated riparian area at the westernmost crossing of the Umatilla River is approximately 150 feet, and the second crossing of the Umatilla River is 100 feet. The Birch Creek vegetated riparian area is approximately 200 feet wide at the line crossing. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in 0.2 mile of moderate residual impacts on bull trout, 0.3 mile of moderate residual impacts on MCR steelhead, and 0.1 mile of moderate residual impacts on SRB steelhead.

Sensitive Fish Species

Butter Creek, the Umatilla River, Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek support redband trout. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 2.0 miles of low residual impacts on redband trout.

Protected Fish Habitats

The Umatilla River, Birch Creek, and Dry Creek support designated critical habitat for MCR steelhead. Designated critical habitat for bull trout is present in the Umatilla River. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River. Coho salmon and associated EFH is present in this portion of Birch Creek. The vegetated riparian area at the westernmost crossing of the Umatilla River is approximately 150 feet, and the easternmost crossing of the Umatilla River is 100 feet. The Birch Creek vegetated riparian area is approximately 200 feet wide at the line crossing. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 0.2 mile of moderate residual impacts on bull trout critical habitat, 0.3 mile of moderate residual impacts on MCR steelhead critical habitat, 0.1 mile of moderate residual impacts on SRB steelhead critical habitat, and approximately 0.3 mile of impacts on coho and Chinook salmon EFH.

Variation S1-A1

This variation crosses the Umatilla River at the same location as the Interstate 84 Alternative. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Umatilla River supports federally listed MCR steelhead and bull trout. The vegetated riparian area at this crossing of the Umatilla River is approximately 100 feet. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in 0.1 mile of moderate residual impacts on bull trout and 0.1 mile of moderate residual impacts on MCR steelhead.

Sensitive Fish Species

The Umatilla River supports redband trout. The vegetated riparian area at the westernmost crossing of the Umatilla River is approximately 150 feet, and the easternmost crossing of the Umatilla River is 100 feet. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in approximately 0.6 mile of low residual impacts on redband trout.

Protected Fish Habitats

The Umatilla River supports designated critical habitat for MCR steelhead and bull trout. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River. The vegetated riparian area at the westernmost crossing of the Umatilla River is approximately 150 feet, and the easternmost crossing of the Umatilla River is 100 feet. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in approximately 0.1 mile of moderate residual impacts on bull trout critical habitat, 0.1 mile of moderate residual impacts on MCR steelhead critical habitat, and approximately 0.2 mile of impacts on coho and Chinook salmon EFH.

Variation S1-A2

This variation crosses the Umatilla River approximately 13 miles downstream from the easternmost crossing of the Umatilla River. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Umatilla River supports federally listed MCR steelhead and bull trout. The vegetated riparian area at the crossing of the Umatilla River is approximately 150 feet. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in 0.2 mile of moderate residual impacts on bull trout and 0.2 mile of moderate residual impacts on MCR steelhead.

Sensitive Fish Species

The Umatilla River supports redband trout. The vegetated riparian area at the crossing of the Umatilla River is approximately 150 feet. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in 0.3 mile of moderate residual impacts on redband trout.

Protected Fish Habitats

The Umatilla River supports designated critical habitat for MCR steelhead and bull trout. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River. The vegetated riparian area at the crossing of the Umatilla River is approximately 150 feet. Based on the impact criteria used in this analysis (Table 3-196), this variation is anticipated to result in 0.2 mile of moderate residual impacts on bull trout and 0.2 mile of moderate residual impacts on MCR steelhead, and approximately 0.2 mile of impacts on coho and Chinook salmon EFH.

Interstate 84 – Southern Route Alternative

This alternative crosses Butter Creek, the Umatilla River twice, West Birch Creek, California Gulch (LLID 1188020454085), East Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Umatilla River, West Birch Creek, California Gulch (LLID 1188020454085), East Birch Creek, and Dry Creek support federally listed MCR steelhead. The Umatilla River also supports federally listed bull trout. The vegetated riparian area at the westernmost crossing of the Umatilla River is approximately 150 feet, and the second crossing of the Umatilla River is 100 feet. At the location of the other crossings, the vegetated riparian width for West Birch Creek is approximately 120 feet, for California Gulch is approximately 50 feet, and for East Birch Creek is approximately 85 feet. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in 0.2 mile of moderate residual impacts on bull trout, 0.6 mile of moderate residual impacts on MCR steelhead, and 0.1 mile of moderate residual impacts on SRB steelhead.

Sensitive Fish Species

Butter Creek, the Umatilla River twice, West Birch Creek, California Gulch (LLID 1188020454085), East Birch Creek, McKay Creek, Rail Creek, Little Beaver Creek, Beaver Creek, and Dry Creek support redband trout. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 2.0 miles of low residual impacts on redband trout.

Protected Fish Habitats

The Umatilla River, West Birch Creek, California Gulch (LLID 1188020454085), East Birch Creek, and Dry Creek support designated critical habitat for MCR steelhead. Designated critical habitat for bull trout is present in the Umatilla River. Chinook and coho salmon and their associated EFH is present within this segment of the Umatilla River. The vegetated riparian area at the westernmost crossing of

the Umatilla River is approximately 150 feet, and the second crossing of the Umatilla River is 100 feet. At the location of the other crossings, the vegetated riparian width for West Birch Creek is approximately 120 feet, for California Gulch is approximately 50 feet, and for East Birch Creek is approximately 85 feet. The Dry Creek riparian area is approximately 140 feet wide at the line crossing. Based on the impact criteria used in this analysis (Table 3-196), this alternative is anticipated to result in approximately 0.2 mile of moderate residual impacts on bull trout critical habitat, 0.3 mile of moderate residual impacts on MCR steelhead critical habitat, 0.1 mile of moderate residual impacts on SRB steelhead critical habitat, and approximately 0.3 mile of impacts on coho and Chinook salmon EFH.

Conclusion

All alternative routes in Segment 1 cross streams that support MCR and SRB steelhead and MCR and SRB steelhead critical habitat, as well as streams that support redband trout. In addition, the Interstate 84 Alternative and Interstate 84 – Southern Route Alternative cross streams that support bull trout, bull trout critical habitat, and Chinook salmon EFH. For all alternative routes, moderate residual impacts are anticipated where streams that support ESA-listed fish, critical habitat, and/or EFH are crossed, and low residual impacts are anticipated where streams that support redband trout are crossed. The West of Bombing Range Road – Southern Route Alternative and the Interstate 84 Alternative are anticipated to result in greater residual impacts on fish resources than the other alternative routes as a greater distance of streams that support redband trout and ESA-listed fish, critical habitat, and/or EFH are crossed.

SEGMENT 2—BLUE MOUNTAINS

The alternatives in Segment 2 cross approximately numerous waterways with fish presence, construct new access roads, remove riparian vegetation, and control noxious weeds through herbicide use.

The number or location of access road crossings will not be available until a route is selected for construction and final design and engineering is completed. However, the construction of new access roads and the upgrades of existing access roads can cause the loss of streamside vegetation, increased sedimentation or pollution runoff to waterways, potential blockage of fish passage, and loss of necessary habitat over the life of the B2H Project.

In Segment 2, no new access road crossings, or modifications of existing road crossings below OHW, would occur in waterways that support ESA-listed fish, designated critical habitat, and/or EFH. Furthermore, no new crossings, or modifications of existing crossings below OHW, would occur within 1,000 feet upstream of waterways, including tributaries that support ESA-listed fish, designated critical habitat, and/or EFH.

For perennial fish-bearing waterways that do not support ESA-listed fish, designated critical habitat, and/or EFH, existing structures would be used when feasible; however, new or modified channel-spanning structures may be used where required. All proposed channel spanning structure designs or modifications for fish-bearing streams would be implemented with approval by ODFW. For seasonal/ephemeral streams, new or modified channel-spanning structures, existing fords, or existing fords that require minor modifications to stabilize (e.g., portable mats, minimal amount of coarse fill)

would be used. Fords would not be created within waterways that support ESA-listed species, designated critical habitat, and/or EFH, or within tributaries 1,000 feet upstream of these areas.

Also, no new access roads will be constructed within the RCA of a waterway that supports ESA-listed fish, designated critical habitat, and/or EFH. However, short segments of new access roads would be constructed within RCAs of waterways that do not support ESA-listed fish, designated critical habitat, and/or EFH.

Furthermore, no new culverts would be installed and no existing culverts would be replaced as part of the Project within Segment 2.

The differences in impacts on fish resources between the alternatives and variations within Segment 2 are mainly related to the number of stream crossings and the extent of vegetation removal that would be required.

Table 3-216 presents the residual impacts on all alternative routes and route variations in Segment 2.

Table 3-216. Fish Resources Inventory Data and Residual Impacts for Segment 2—Blue Mountain

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)					Residual Impacts (miles crossed)		
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat[1]	Middle Columbia River Steelhead Critical Habitat[2]	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams	None	Low	Moderate
Applicant's Proposed Action	33.8	0.1	0.3	0.0	0.7	2.3	31.3	1.8	0.7
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.9*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.2*	*0.0*	*0.4*	*0.4*	*3.2*	*0.1*	*0.4*
Variation S2-B2	*3.8*	*0.0*	*0.2*	*0.0*	*0.4*	*0.3*	*3.4*	*0.0*	*0.4*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.2*	*0.3*	*8.9*	*0.2*	*0.2*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.3*	*0.6*	*8.1*	*0.4*	*0.3*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*2.2*	*0.1*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*2.5*	*0.1*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*10.8*	*1.3*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*11.3*	*0.9*	*0.0*
Glass Hill	33.7	0.1	0.1	0.0	0.6	2.6	31.0	2.1	0.6
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.5*	*0.4*	*3.8*	*0.0*	*0.5*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.4*	*0.4*	*3.7*	*0.0*	*0.4*
Mill Creek	34.0	0.1	0.2	0.0	0.6	1.4	32.5	0.9	0.6

Table Notes:
[1]Chinook salmon Critical Habitat is used as a surrogate for Chinook salmon and coho salmon Essential Fish Habitat
[2]MCR steelhead or associated critical habitat does not occur in Segment 2.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses Ladd Creek, the Grande Ronde River, Rock Creek, Sheep Creek, Graves Creek, the Powder River, and an unnamed stream (1181152452353). These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Ladd Creek, the Grande Ronde River, Rock Creek, Graves Creek, and an unnamed stream (1181152452353) support federally listed SRB steelhead. The Grande Ronde River and Rock Creek support federally listed SR Chinook salmon. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in 0.7 mile of moderate residual impacts on SRB steelhead and 0.3 mile of moderate residual impacts on SR Chinook salmon.

Sensitive Fish Species

Ladd Creek, the Grande Ronde River, Rock Creek, Sheep Creek, Graves Creek, the Powder River, and an unnamed stream (1181152452353) support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 2.3 miles of low residual impacts on redband trout.

Protected Fish Habitats

Ladd Creek, the Grande Ronde River, Rock Creek, Graves Creek, and an unnamed stream (1181152452353) support designated critical habitat for SRB steelhead. The Grande Ronde River and Rock Creek support designated critical habitat for SR Chinook salmon. Coho salmon and Chinook salmon EFH is present within the Grande Ronde River and Rock Creek. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 0.7 mile of moderate residual impacts on SRB steelhead critical habitat, 0.3 mile of moderate residual impacts on SR Chinook salmon critical habitat, and approximately 0.3 mile of residual impacts on Chinook salmon and coho EFH.

Variation S2-A1

Variation S2-A1 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with Variation S2-A2, Variation S2-A1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S2-A2, Variation S2-A1 does not cross any streams with support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with Variation S2-A2, Variation S2-A1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-A2

As with Variation S2-A1, Variation S2-A2 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with Variation S2-A1, Variation S2-A2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S2-A1, Variation S2-A2 does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with Variation S2-A1, Variation S2-A2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-B1

Variation S2-B1 crosses Rock Creek, Sheep Creek, and Graves Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Variation S2-B1 crosses Rock Creek and Graves Creek, which support federally listed SRB steelhead. Rock Creek also supports SR Chinook salmon. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-B1 is anticipated to result in 0.4 mile of moderate residual impacts on SRB steelhead and 0.2 mile of moderate residual impacts on SR Chinook salmon. Variation S2-B1 is anticipated to result in

similar impacts on SRB steelhead and SR Chinook salmon as Variation S2-B2 except impacts will occur at different stream crossing locations.

Sensitive Fish Species

Variation S2-B1 crosses Rock Creek, Sheep Creek, and Graves Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-B1 is anticipated to result in approximately 0.4 mile of low residual impacts on redband trout. Variation S2-B1 is anticipated to result in slightly greater impacts on redband trout than Variation S2-B2.

Protected Fish Habitats

Variation S2-B1 crosses Rock Creek and Graves Creek, which support designated critical habitat for SRB steelhead. Rock Creek also supports critical habitat for SR Chinook salmon. Coho salmon and Chinook salmon EFH is present within Rock Creek. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-B1 is anticipated to result in approximately 0.4 mile of moderate residual impacts on SRB steelhead critical habitat, 0.2 mile of moderate residual impacts on SR Chinook salmon critical habitat, and approximately 0.2 mile of moderate residual impacts on Chinook salmon and coho EFH. Variation S2-B1 is anticipated to result in similar impacts on protected fish habitats as Variation S2-B2 except impacts will occur at different stream crossing locations.

Variation S2-B2

Variation S2-B2 crosses Rock Creek and Sheep Creek. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Variation S2-B2 crosses Rock Creek and Sheep Creek, which support federally listed SRB steelhead. Rock Creek also supports SR Chinook salmon. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-B2 is anticipated to result in 0.4 mile of moderate residual impacts on SRB steelhead and 0.2 mile of moderate residual impacts on SR Chinook salmon. Variation S2-B2 is anticipated to result in similar impacts on SRB steelhead and SR Chinook salmon as Variation S2-B1 except impacts will occur at different stream crossing locations.

Sensitive Fish Species

Variation S2-B2 crosses Rock Creek and Sheep Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-B2 is anticipated to result in approximately 0.3

mile of low residual impacts on redband trout. Variation S2-B2 is anticipated to result in slightly less impacts on redband trout than Variation S2-B1.

Protected Fish Habitats

Variation S2-B2 crosses Rock Creek and Sheep Creek, which support designated critical habitat for SRB steelhead. Rock Creek also supports critical habitat for SR Chinook salmon. Coho salmon and Chinook salmon EFH is present within Rock Creek. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-B2 is anticipated to result in approximately 0.4 mile of moderate residual impacts on SRB steelhead, 0.2 mile of moderate residual impacts on SR Chinook salmon, and approximately 0.2 mile of moderate residual impacts on Chinook salmon and coho EFH. Variation S2-B2 is similar to Variation S2-B1 for impacts on protected fish habitats except impacts will occur at different stream crossing locations.

Variation S2-C1

Variation S2-C1 crosses an unnamed stream (1181152452353). This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Variation S2-C1 crosses an unnamed stream (1181152452353), which supports federally listed SRB steelhead. Vegetated riparian zone at the crossing is 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-C1 is anticipated to result in 0.2 mile of moderate residual impacts on SRB steelhead. Variation S2-C1 is anticipated to result in slightly less impacts on SRB steelhead than Variation S2-C2.

Sensitive Fish Species

Variation S2-C1 crosses an unnamed stream (1181152452353), which supports redband trout. Vegetated riparian zone at the crossing is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-C1 is anticipated to result in 0.3 mile of low residual impacts on redband trout. Variation S2-C1 would have approximately 0.3 mile less impacts on redband trout than that of Variation S2-C2.

Protected Fish Habitats

Variation S2-C1 crosses an unnamed stream (1181152452353), which supports designated critical habitat for SRB steelhead. Vegetated riparian zone at the crossing is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-C1 is anticipated to result in 0.2 mile of moderate residual impacts on SRB steelhead critical habitat. Variation S2-C1 is anticipated to result in slightly less impacts on protected fish habitat than Variation S2-C2.

Variation S2-C2

Variation S2-C1 crosses Sheep Creek. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Variation S2-C2 crosses Sheep Creek, which supports federally listed SRB steelhead. Vegetated riparian zone at the crossing is approximately 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-C2 is anticipated to result in 0.3 mile of moderate residual impacts on SRB steelhead. Variation S2-C2 is anticipated to result in slightly greater impacts on SRB steelhead than Variation S2-C1.

Sensitive Fish Species

Variation S2-C2 crosses Sheep Creek, which supports redband trout. Vegetated riparian zone at the crossing is approximately 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-C2 is anticipated to result in 0.6 mile of low residual impacts on redband trout. Variation S2-C2 would have approximately 0.3 mile greater impacts on redband trout than that of Variation S2-C1.

Protected Fish Habitats

Variation S2-C2 crosses Sheep Creek, which supports designated critical habitat for SRB steelhead. Vegetated riparian zone at the crossing is approximately 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-C2 is anticipated to result in 0.3 mile of moderate residual impacts on SRB steelhead critical habitat. Variation S2-C2 is anticipated to result in slightly greater impacts on protected fish habitat than Variation S2-C1.

Variation S2-E1

Variation S2-E1 does not cross any streams that support federally listed or candidate fish species. However, Variation S2-E1 crosses an unnamed stream (1180138451966), which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S2-E2, Variation S2-E1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-E1 crosses an unnamed stream (1180138451966), which supports redband trout. Vegetated riparian zones at this stream is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-E1 is anticipated to result in 0.1 mile of low residual impacts on redband trout. Variation S2-E1 is anticipated to have similar impacts on redband trout as Variation S2-E2 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variation S2-E2, Variation S2-E1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-E2

Variation S2-E2 does not cross any streams that support federally listed or candidate fish species. However, Variation S2-E2 crosses an unnamed stream (1180138451966), which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S2-E1, Variation S2-E2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-E2 crosses an unnamed stream (1180138451966), which supports redband trout. Vegetated riparian zones at this stream is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-E2 is anticipated to result in 0.1 mile of low residual impacts on redband trout. Variation S2-E2 is anticipated to have similar impacts on redband trout as Variation S2-E1 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variation S2-E1, Variation S2-E2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-F1

Variation S2-F1 crosses the Powder River. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The

types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S2-F2, Variation S2-F1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-F1 crosses the Powder River, which supports redband trout. Vegetated riparian zone at the crossing is 100 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-F1 is anticipated to result in 1.3 mile of low residual impacts on redband trout. S2-F1 is anticipated to result in approximately 0.4 mile greater impacts on redband trout than Variation S2-F2.

Protected Fish Habitats

As with Variation S2-F2, Variation S2-F1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S2-F2

Variation S2-F2 crosses the Powder River. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S2-F1, Variation S2-F2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S2-F2 crosses the Powder River, which supports redband trout. Vegetated riparian zone at the crossing is 100 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-F2 is anticipated to result in 0.9 mile of low residual impacts on redband trout. Variation S2-F2 is anticipated to result in approximately 0.4 mile fewer impacts on redband trout than Variation S2-F1.

Protected Fish Habitats

As with Variation S2-F1, Variation S2-F2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Glass Hill Alternative

The Glass Hill Alternative crosses Ladd Creek, the Grande Ronde River, Rock Creek, Graves Creek, Powder River, and unnamed streams (1181152452353 and 1181404452558). These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Glass Hill Alternative crosses Ladd Creek, the Grande Ronde River, Rock Creek, Graves Creek, and unnamed streams (1181152452353 and 1181404452558), which support federally listed SRB steelhead. The Grande Ronde River and Rock Creek also support federally listed SR Chinook salmon. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), the Glass Hill Alternative is anticipated to result in 0.6 mile of moderate residual impacts on SRB steelhead and 0.1 mile of moderate residual impacts on SR Chinook salmon. The Glass Hill Alternative is anticipated to result in slightly less impacts on SRB steelhead and SR Chinook salmon than the Applicant's Proposed Action Alternative.

Sensitive Fish Species

The Glass Hill Alternative crosses Ladd Creek, the Grande Ronde River, Rock Creek, Graves Creek, and unnamed streams (1181152452353 and 1181404452558), which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), the Glass Hill Alternative is anticipated to result in approximately 2.6 miles of low residual impacts on redband trout. The Glass Hill Alternative is anticipated to result in approximately 0.3 mile of greater impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

The Glass Hill Alternative crosses Ladd Creek, the Grande Ronde River, Rock Creek, Graves Creek, and unnamed streams (1181152452353 and 1181404452558), which support designated critical habitat for SRB steelhead. The Grande Ronde River and Rock Creek support designated critical habitat for SR Chinook salmon. Coho salmon and Chinook salmon EFH is present within the Grande Ronde River and Rock Creek. Vegetated riparian zones at these streams vary from approximately 50 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), the Glass Hill Alternative is anticipated to result in approximately 0.6 mile of moderate residual impacts on SRB steelhead critical habitat, 0.1 mile of moderate residual impacts on SR Chinook salmon critical habitat, and approximately 0.1 mile of residual impacts on Chinook salmon and coho EFH. The Glass Hill Alternative is anticipated to result in slightly less impacts on protected fish habitats than the Applicant's Proposed Action Alternative.

Variation S2-D1

Variation S2-D1 crosses Rock Creek, Graves Creek, Powder River, and unnamed streams (1181152452353 and 1181404452558). These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Variation S2-D1 crosses Rock Creek, Graves Creek, and unnamed streams (1181152452353 and 1181404452558), which support federally listed SRB steelhead. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), the Variation S2-D1 is anticipated to result in 0.5 mile of moderate residual impacts on SRB steelhead. Variation S2-D1 is anticipated to result in slightly greater impacts on SRB steelhead than Variation S2-D2.

Sensitive Fish Species

Variation S2-D1 crosses Rock Creek, Graves Creek, and unnamed streams (1181152452353 and 1181404452558), which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-D1 is anticipated to result in 0.4 mile of low residual impacts on redband trout. Variation S2-D1 is anticipated to have similar impacts on redband trout as Variation S2-D2 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

Variation S2-D1 crosses Rock Creek, Graves Creek, and unnamed streams (1181152452353 and 1181404452558), which support SRB steelhead designated critical habitat. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-D1 is anticipated to result in approximately 0.5 mile of moderate residual impacts on SRB steelhead critical habitat. Variation S2-D1 is anticipated to result in slightly greater impacts on SRB steelhead critical habitat than Variation S2-D2.

Variation S2-D2

Variation S2-D2 crosses Rock Creek, Graves Creek, Powder River, and unnamed stream (1181152452353). These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing

access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

Variation S2-D2 crosses Rock Creek, Graves Creek, and unnamed stream (1181152452353), which support federally listed SRB steelhead. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-D2 is anticipated to result in 0.4 mile of moderate residual impacts on SRB steelhead. Variation S2-D2 is anticipated to result in slightly less impacts on SRB steelhead than Variation S2-D1.

Sensitive Fish Species

Variation S2-D2 crosses Rock Creek, Graves Creek, and unnamed stream 1152452353], which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-D2 is anticipated to result in 0.4 mile of low residual impacts on redband trout. Variation S2-D2 is anticipated to have similar impacts on redband trout as Variation S2-D1 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

Variation S2-D2 crosses Rock Creek, Graves Creek, and unnamed stream (1181152452353), which support SRB steelhead designated critical habitat. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S2-D2 is anticipated to result in 0.4 mile of moderate residual impacts on SRB steelhead critical habitat. S2-D2 is anticipated to result in slightly less impacts on SRB steelhead designated critical habitat than Variation S2-D1.

Mill Creek Alternative

The Mill Creek Alternative crosses Mill Creek, Ladd Creek, the Grande Ronde River, Rock Creek, and the Powder River. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Mill Creek Alternative crosses Mill Creek, Ladd Creek, the Grande Ronde River, and Rock Creek, which support federally listed SRB steelhead. The Grande Ronde River and Rock Creek also support federally listed SR Chinook salmon. Vegetated riparian zones at these streams vary from approximately 50 feet to 400 feet. Based on the impact criteria used in this analysis (Table 3-196), the Mill Creek Alternative is anticipated to result in 0.6 mile of moderate residual impacts on SRB steelhead and 0.2

mile of moderate residual impacts on SR Chinook salmon. The Mill Creek is anticipated to result in slightly less impacts on SRB steelhead and SR Chinook salmon than the Applicant's Proposed Action Alternative.

Sensitive Fish Species

The Mill Creek Alternative crosses Mill Creek, Ladd Creek, the Grande Ronde River, Rock Creek, and the Powder River, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 400 feet. Based on the impact criteria used in this analysis (Table 3-196), the Mill Creek Alternative is anticipated to result in approximately 1.4 miles of low residual impacts on redband trout. The Mill Creek Alternative is anticipated to result in approximately 0.9 mile of fewer impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

The Mill Creek Alternative crosses Mill Creek, Ladd Creek, the Grande Ronde River, and Rock Creek, which support federally SRB steelhead critical habitat. The Grande Ronde River and Rock Creek also support SR Chinook salmon designated critical habitat. Coho salmon and Chinook salmon EFH is present within the Grande Ronde River and Rock Creek. Vegetated riparian zones at these streams vary from approximately 50 feet to 400 feet. Based on the impact criteria used in this analysis (Table 3-196), the Mill Creek Alternative is anticipated to result in 0.6 mile of moderate, residual impacts on SRB steelhead critical habitat and 0.2 mile of moderate, residual impacts on SR Chinook salmon critical habitat and approximately 0.2 mile of moderate, residual impacts on coho salmon and Chinook salmon EFH. The Mill Creek is anticipated to result in slightly less impacts on protected fish habitats than the Applicant's Proposed Action Alternative.

Conclusion

All alternative routes in Segment 2 cross streams that support SRB steelhead, Chinook salmon, bull trout, and associated protected fish habitats, as well as streams that support redband trout. For all alternative routes, moderate residual impacts are anticipated where streams that support ESA-listed fish and associated protected fish habitats are crossed, and low residual impacts are anticipated where streams that support redband trout are crossed. The Glass Hill Alternative is anticipated to result in greater residual impacts on fish resources than the other alternative routes as a greater distance of streams that support redband trout, ESA-listed fish, and associated protected fish habitats are crossed.

SEGMENT 3—BAKER VALLEY

The alternatives in Segment 3 cross numerous waterways with fish presence, construct new access roads, remove riparian vegetation, and control noxious weeds through herbicide use.

The number or location of access road crossings will not be available until a route is selected for construction and final design and engineering is completed. However, the construction of new access roads and the upgrades of existing access roads can cause the loss of streamside vegetation, increased sedimentation or pollution runoff to waterways, potential blockage of fish passage, and loss of necessary habitat over the life of the B2H Project.

Waterways in Segment 3 within the B2H analysis area do not support ESA-listed fish, designated critical habitat, and/or EFH; however, waterways within Segment 3 do support special status fish species[3]. For perennial fish-bearing waterways within Segment 3, existing structures would be used when feasible; however, new or modified channel-spanning structures, including in-water work, may be used where required. All proposed channel spanning structure designs or modifications for fish-bearing streams would be implemented with approval by ODFW. For seasonal/ephemeral streams, new or modified channel-spanning structures, existing fords, or existing fords that require minor modifications to stabilize (e.g., portable mats, minimal amount of coarse fill) would be used.

Also, short segments of new access roads that do not cross a waterway would be constructed in RCAs of waterways that support special status fish species.

The differences in impacts on fish resources between the alternatives and variations within Segment 3 are mainly related to the number of stream crossings and the extent of vegetation removal that would be required.

Table 3-217 presents the residual impacts on all alternative routes and route variations in Segment 3.

Table 3-217. Fish Resources Inventory Data and Residual Impacts for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)					Residual Impacts (miles crossed)		
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat[1]	Middle Columbia River Steelhead Critical Habitat[2]	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams	None	Low	Moderate
Applicant's Proposed Action	55.2	0.0	0.0	0.0	0.0	3.8	51.4	3.8	0.0
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*1.1*	*11.3*	*1.1*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*11.7*	*0.5*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0*	*13.9*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0*	*14.4*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0*	*14.7*	*0.0*	*0.0*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0*	*14.3*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0*	*14.0*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*	*2.6*	*18.5*	*2.6*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*	*2.8*	*18.9*	*2.8*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*	*2.2*	*18.9*	*2.2*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*0.0*	*2*	*19.4*	*2*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.1*	*19.9*	*1.1*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*0.0*	*1.4*	*23.3*	*1.4*	*0.0*
Flagstaff A	55.3	0.0	0.0	0.0	0.0	3.8	51.5	3.8	0.0

[3] Federally listed bull trout and bull trout critical habitat are present within Segment 3 (e.g. Eagle Creek) but are not present within the B2H Project analysis area.

Table 3-217. Fish Resources Inventory Data and Residual Impacts for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)					Residual Impacts (miles crossed)		
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat[1]	Middle Columbia River Steelhead Critical Habitat[2]	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams	None	Low	Moderate
Timber Canyon	70.3	0.0	0.0	0.0	0.0	5.1	65.2	5.1	0.0
Flagstaff A – Burnt River Mountain	55.3	0.0	0.0	0.0	0.0	3.4	51.9	3.4	0.0
Flagstaff B	56.0	0.0	0.0	0.0	0.0	3.8	52.2	3.8	0.0
Flagstaff B – Burnt River West	55.7	0.0	0.0	0.0	0.0	1.7	54	1.7	0.0
Flagstaff B – Durkee	59.6	0.0	0.0	0.0	0.0	2.6	57	2.6	0.0

Table Notes:
[1]Chinook salmon and SRB steelhead have been extirpated from their historic range in Segment 3 – no critical habitat designated.
[2]MCR steelhead or associated critical habitat does not occur in Segment 3.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. However, the Applicant's Proposed Action Alternative crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Pritchard Creek, Sisley Creek, and Unity Creek, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Pritchard Creek, Sisley Creek, and Unity Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 3.8 miles of low, residual impacts on redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S3-A1

Variation S3-A1 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-A1 crosses Gentry Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S3-A2, Variation S3-A1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-A1 crosses Gentry Creek, which support redband trout. Vegetated riparian zones at this stream is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-A1 is anticipated to result in approximately 1.1 miles of low, residual impacts on redband trout. Variation S3-A1 is anticipated to have approximately 0.6 mile greater impacts on redband trout than Variation S3-A2.

Protected Fish Habitats

As with Variation S3-A2, Variation S3-A1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-A2

Variation S3-A2 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-A2 crosses Gentry Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S3-A1, Variation S3-A2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-A2 crosses Gentry Creek, which supports redband trout. Vegetated riparian zones at this stream is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-A2 is anticipated to result in approximately 0.5 mile of low, residual impacts on redband trout. Variation S3-A2 is anticipated to have approximately 0.6 mile fewer impacts on redband trout than Variation S3-A1.

Protected Fish Habitats

As with Variation S3-A1, Variation S3-A2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B1

Variation S3-B1 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or other candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B2

Variation S3-B2 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or other candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B3

Variation S3-B3 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), S3-B this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B4

Variation S3-B4 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-B5

Variation S3-B5 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with all S3-B variations (Variations S3-B1 through S3-B5), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C1

Variation S3-C1 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-C1 crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Sisley Creek, Low Creek, Swayze Creek, North Fork Swayze Creek, and Unity Creek, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection Project design features and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C1 crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Sisley Creek, Low Creek, Swayze Creek, North Fork Swayze Creek, and Unity Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-C1 is anticipated to result in approximately 2.6 miles of low, residual impacts on redband trout. Variation S3-C1 is anticipated to result in less impacts on redband trout than Variation S3-C2 but a greater impact on redband trout than the rest of the S3-C variations.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C2

Variation S3-C2 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-C2 crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Sisley Creek, Low Creek, Swayze Creek, North Fork Swayze Creek, and Unity Creek, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially

resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C2 crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Sisley Creek, Low Creek, Swayze Creek, North Fork Swayze Creek, and Unity Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-C2 is anticipated to result in approximately 2.8 miles of low, residual impacts on redband trout. Variation S3-C2 is anticipated to result in greater impacts on redband trout than the rest of the S3-C variations.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C3

Variation S3-C3 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-C3 crosses the Burnt River, Shirttail Creek, Powell Creek, Alder Creek, Low Creek, and Dixie Creek, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C3 crosses the Burnt River, Shirttail Creek, Powell Creek, Alder Creek, Low Creek, and Dixie Creek, which support redband trout. Vegetated riparian zones at these streams vary from

approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-C3 is anticipated to result in approximately 2.2 miles of low, residual impacts on redband trout. Variation S3-C3 is anticipated to result in less impacts on redband trout than Variation S3-C1 and S3-C2 but a greater impact on redband trout than Variations S3-C4 through S3-C6.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C4

Variation S3-C4 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-C4 crosses the Burnt River, Shirttail Creek, Powell Creek, Alder Creek, Low Creek, Dixie Creek, and Banks Ditch, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C4 crosses the Burnt River, Shirttail Creek, Powell Creek, Alder Creek, Low Creek, Dixie Creek, and Banks Ditch, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-C4 is anticipated to result in approximately 2.0 miles of low, residual impacts on redband trout. Variation S3-C4 is anticipated to result in less impacts on redband trout than Variation S3-C1 through S3-C3 but a greater impact on redband trout than Variations S3-C5 and S3-C6.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C5

Variation S3-C5 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-C5 crosses the Burnt River, Shirttail Creek, Powell Creek, Alder Creek, Low Creek, and Dixie Creek, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section

3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C5 crosses the Burnt River, Shirttail Creek, Powell Creek, Alder Creek, Low Creek, and Dixie Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-C5 is anticipated to result in approximately 1.1 miles of low, residual impacts on redband trout. Variation S3-C5 is anticipated to result in fewer impacts on redband trout than the rest of the S3-C variations.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S3-C6

Variation S3-C6 does not cross any streams that support federally listed or candidate fish species. However, Variation S3-C6 crosses the Burnt River, Dixie Creek, Alder Creek, Low Creek, and North Fork Dixie Creek, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S3-C6 crosses the Burnt River, Dixie Creek, Alder Creek, Low Creek, and North Fork Dixie Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S3-C6 is anticipated to result in approximately 1.4 miles of low, residual impacts on redband

trout. Variation S3-C6 is anticipated to result in less impacts on redband trout than Variation S3-C1 through S3-C4 but a greater impact on redband trout than Variations S3-C5.

Protected Fish Habitats

As with all S3-C variations (Variations S3-C1 through S3-C6), this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Flagstaff A Alternative

As with the Applicant's Proposed Action Alternative, the Flagstaff A Alternative does not cross any streams that support federally listed or candidate fish species. Also, similar to the Applicant's Proposed Action Alternative, the Flagstaff A Alternative crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Pritchard Creek, Sisley Creek, and Unity Creek, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Flagstaff A Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

Similar to the Applicant's Proposed Action Alternative, the Flagstaff A Alternative crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Pritchard Creek, Sisley Creek, and Unity Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Flagstaff A Alternative is anticipated to result in approximately 3.8 miles of low, residual impacts on redband trout. The Flagstaff A Alternative is anticipated to result in similar impacts on redband trout as the Applicant's Proposed Action Alternative except impacts will occur at different stream crossing locations.

Protected Fish Habitats

The Flagstaff A Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Timber Canyon Alternative

As with the Applicant's Proposed Action Alternative, the Timber Canyon Alternative does not cross any streams that support federally listed or candidate fish species. However, the Timber Canyon Alternative crosses Beagle Creek, Big Creek, the Burnt River, Chalk Creek, Dixie Creek, Gold Creek, Goose Creek, Lick Creek, McCurry Creek, North Fork Daly Creek, the Powder River (twice), Sisley Creek, and

unnamed streams (1172125447534 [previously Rock Gulch] and 1176329450110 [previously Bazine Creek]), which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Timber Canyon Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Timber Canyon Alternative crosses Beagle Creek, Big Creek, the Burnt River, Chalk Creek, Dixie Creek, Gold Creek, Goose Creek, Lick Creek, McCurry Creek, North Fork Daly Creek, the Powder River (twice), Sisley Creek, and unnamed streams (1172125447534 [previously Rock Gulch] and 1176329450110 [previously Bazine Creek]), which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), the Timber Canyon Alternative is anticipated to result in approximately 5.1 miles of low, residual impacts on redband trout. The Timber Canyon Alternative is anticipated to result in approximately 1.3 miles of greater impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Timber Canyon Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Flagstaff A – Burnt River Mountain Alternative

As with the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative does not cross any streams that support federally listed or candidate fish species. However, the Flagstaff A – Burnt River Mountain Alternative crosses Alder Creek, the Burnt River, Dixie Creek, Powell Creek, and Shirttail Creek, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Flagstaff A - Burnt River Mountain Alternative crosses Alder Creek, the Burnt River, Dixie Creek, Powell Creek, and Shirttail Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Flagstaff A – Burnt River Mountain Alternative is anticipated to result in approximately 3.4 miles of low, residual impacts on redband trout. The Flagstaff A – Burnt River Mountain Alternative is anticipated to result in approximately 0.4 mile of fewer impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Flagstaff B Alternative

As with the Applicant's Proposed Action Alternative, the Flagstaff B Alternative does not cross any streams that support federally listed or candidate fish species. Also, similar to the Applicant's Proposed Action Alternative, the Flagstaff B Alternative crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Pritchard Creek, Sisley Creek, and Unity Creek, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff B Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

Similar to the Applicant's Proposed Action Alternative, the Flagstaff B Alternative crosses the Burnt River, Dixie Creek, Durkee Creek, Manning Creek, Pritchard Creek, Sisley Creek, and Unity Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Flagstaff B

Alternative is anticipated to result in approximately 3.8 miles of low, residual impacts on redband trout. The Flagstaff B Alternative is anticipated to result in similar impacts on redband trout as the Applicant's Proposed Action Alternative except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff B Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Flagstaff B – Burnt River West Alternative

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative does not cross any streams that support federally listed or candidate fish species. However, the Flagstaff B – Burnt River West Alternative crosses Alder Creek, the Burnt River, Dixie Creek, and Powell Creek, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Flagstaff B - Burnt River West Alternative crosses Alder Creek, the Burnt River, Dixie Creek, and Powell Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Flagstaff B – Burnt River West Alternative is anticipated to result in approximately 1.7 miles of low, residual impacts on redband trout. The Flagstaff B – Burnt River West Alternative is anticipated to result in approximately 2.1 miles of fewer impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Flagstaff B – Durkee Alternative

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative does not cross any streams that support federally listed or candidate fish species. However, the Flagstaff B – Durkee Alternative crosses Alder Creek, the Burnt River, Dixie Creek, North Fork Dixie Creek (twice), and unnamed streams (1174727444702 and 1174799444659), which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Flagstaff B – Durkee Alternative crosses Alder Creek, the Burnt River, Dixie Creek, North Fork Dixie Creek (twice), and unnamed streams (1174727444702 and 1174799444659), which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Flagstaff B – Durkee Alternative is anticipated to result in approximately 2.6 miles of low, residual impacts on redband trout. The Flagstaff B – Durkee Alternative is anticipated to result in approximately 1.2 miles of fewer impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Conclusion

None of the alternative routes in Segment 3 cross streams that support ESA-listed fish, critical habitat, and/or EFH; however, all of the alternative routes in Segment 3 cross streams that support redband trout. Low residual impacts are anticipated where streams that support redband trout are crossed. The Timber Canyon Alternative is anticipated to result in greater residual impacts on fish resources than the other alternative routes as a greater distance of streams that support redband trout are crossed.

SEGMENT 4—BROGAN

The alternatives in Segment 4 cross numerous waterways with fish presence, construct new access roads, remove riparian vegetation, and control noxious weeds through herbicide use.

The number or locations of access road crossings will not be available until a route is selected for construction and final design and engineering is completed. However, the construction of new access roads and the upgrades of existing access roads can cause the loss of streamside vegetation, increased sedimentation or pollution runoff to waterways, potential blockage of fish passage, and loss of necessary habitat over the life of the B2H Project.

Waterways within Segment 4 do not support ESA-listed fish, designated critical habitat, and/or EFH; however, waterways within Segment 4 do support special status fish species. For perennial fish-bearing waterways within Segment 4, existing structures would be used when feasible; however, new or modified channel-spanning structures may be used where required. All proposed channel spanning structure designs or modifications for fish-bearing streams would be implemented with approval by ODFW. For seasonal/ephemeral streams, new or modified channel-spanning structures, existing fords, or existing fords that require minor modifications to stabilize (e.g., portable mats, minimal amount of coarse fill) would be used.

Also, short segments of new access roads that do not cross a waterway would be constructed within RCAs of waterways that support special status fish species.

The differences in impacts on fish resources between the alternatives and variations within Segment 4 are mainly related to the number of stream crossings and the extent of vegetation removal that would be required.

Table 3-218 presents the residual impacts on all alternative routes and route variations in Segment 4.

Table 3-218. Fish Resources Inventory Data and Residual Impacts for Segment 4—Brogan

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)					Residual Impacts (miles crossed)		
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams	None	Low	Moderate
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0	1.0	39.1	1.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*5.6*	*0.3*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*5.7*	*0.3*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*5.8*	*0.3*	*0.0*
Tub Mountain South	40.5	0.0	0.0	0.0	0.0	1.5	39.0	1.5	0.0
Willow Creek	34.6	0.0	0.0	0.0	0.0	0.9	33.7	0.9	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. However, the Applicant's Proposed Action Alternative crosses Willow Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would

decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses Willow Creek, which supports redband trout. Vegetated riparian zones at this stream is approximately 50 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 1.0 mile of low, residual impacts on redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S4-A1

Variation S4-A1 does not cross any streams that support federally listed or candidate fish species. However, Variation S4-A1 crosses Goodman Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variations S4-A2 and S4-A3, this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S4-A1 crosses Goodman Creek, which supports redband trout. Vegetated riparian zones at this stream is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S4-A1 is anticipated to result in approximately 0.3 mile of low, residual impacts on redband trout. Variation S4-A1 is anticipated to result in similar impacts on redband trout as Variations S4-A2 and S4-A3 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variations S4-A2 and S4-A3, this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S4-A2

Variation S4-A2 does not cross any streams that support federally listed or candidate fish species. However, Variation S4-A2 crosses Goodman Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S4-A2 crosses Goodman Creek, which supports redband trout. Vegetated riparian zones at this stream is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S4-A2 is anticipated to result in approximately 0.3 mile of low, residual impacts on redband trout. Variation S4-A2 is anticipated to result in similar impacts on redband trout as Variations S4-A1 and S4-A3 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S4-A3

Variation S4-A3 does not cross any streams that support federally listed or candidate fish species. However, Variation S4-A3 crosses Goodman Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S4-A3 crosses Goodman Creek, which supports redband trout. Vegetated riparian zones at this stream is approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S4-A3 is anticipated to result in approximately 0.3 mile of low, residual impacts on redband trout. Variation S4-A3 is anticipated to result in similar impacts on redband trout as Variations S4-A1 and S4-A2 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variations S4-A1 and S4-A3, this variation does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Tub Mountain South Alternative

The Tub Mountain South Alternative does not cross any streams that support federally listed or candidate fish species. However, the Tub Mountain South Alternative crosses Goodman Creek, Birch Creek, Benson Creek, Durbin Creek, and Willow Creek, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Tub Mountain South Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Tub Mountain South Alternative crosses Goodman Creek, Birch Creek, Benson Creek, Durbin Creek, and Willow Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), The Tub Mountain South Alternative is anticipated to result in approximately 1.5 miles of low, residual impacts on redband trout. The Tub Mountain South Alternative is anticipated to result in approximately 0.5 mile greater impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Tub Mountain South Alternative does not cross any streams that support sensitive fish species. No identifiable impacts from this alternative are anticipated.

Willow Creek Alternative

The Willow Creek Alternative does not cross any streams that support federally listed or candidate fish species. However, the Willow Creek Alternative crosses Goodman Creek, Birch Creek, Benson Creek, Durbin Creek, and Willow Creek, which support redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Willow Creek Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

The Willow Creek Alternative crosses Goodman Creek, Birch Creek, Benson Creek, Durbin Creek, and Willow Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), The Willow Creek Alternative is anticipated to result in approximately 0.9 mile of low, residual impacts on redband trout. The Willow Creek Alternative is anticipated to result in slightly less impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Willow Creek Alternative does not cross any streams that support sensitive fish species. No identifiable impacts from this alternative are anticipated.

Conclusion

None of the alternative routes in Segment 4 cross streams that support ESA-listed fish, critical habitat, and/or EFH; however, all of the alternative routes in Segment 4 cross streams that support redband trout. Low residual impacts are anticipated where streams that support redband trout are crossed. The Tub Mountain South Alternative is anticipated to result in greater residual impacts on fish resources than the other alternative routes as a greater distance of streams that support redband trout are crossed.

SEGMENT 5—MALHEUR

The alternatives in Segment 5 cross numerous waterways with fish presence, construct new access roads, remove riparian vegetation, and control noxious weeds through herbicide use.

The number or locations of access road crossings will not be available until a route is selected for construction and final design and engineering is completed. However, the construction of new access

roads and the upgrades of existing access roads can cause the loss of streamside vegetation, increased sedimentation or pollution runoff to waterways, potential blockage of fish passage, and loss of necessary habitat over the life of the B2H Project.

Waterways within Segment 5 do not support ESA-listed fish, designated critical habitat, and/or EFH; however, waterways within Segment 5 do support special status fish species. For perennial fish-bearing waterways within Segment 5, existing structures would be used when feasible; however, new or modified channel-spanning structures may be used where required. All proposed channel spanning structure designs or modifications for fish-bearing streams would be implemented with approval by ODFW. For seasonal/ephemeral streams, new or modified channel-spanning structures, existing fords, or existing fords that require minor modifications to stabilize (e.g., portable mats, minimal amount of coarse fill) would be used.

Also, short segments of new access roads that do not cross a waterway would be constructed within RCAs of waterways that support special status fish species.

The differences in impacts on fish resources between the alternatives and variations within Segment 5 are mainly related to the number of stream crossings and the extent of vegetation removal that would be required.

Table 3-219 presents the residual impacts on all alternative routes and route variations in Segment 5.

Table 3-219. Fish Resources Inventory Data and Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)					Residual Impacts (miles crossed)		
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams	None	Low	Moderate
Applicant's Proposed Action	40.4	0.0	0.0	0.0	0.0	1.1	39.3	1.1	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*7.4*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*1.9*	*0.6*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*2.6*	*0.2*	*0.0*
Malheur S	43.5	0.0	0.0	0.0	0.0	0.5	43.0	0.5	0.0
Malheur A	43.1	0.0	0.0	0.0	0.0	0.5	42.6	0.5	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. However, the Applicant's Proposed Action Alternative crosses the Owyhee River, Bully Creek, Cottonwood Creek, and the Malheur River, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in

increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses the Owyhee River, Bully Creek, Cottonwood Creek, and the Malheur River, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 1.1 miles of low, residual impacts on redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S5-A1

Variation S5-A1 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with Variation S5-A2, Variation S5-A1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S5-A2, Variation S5-A1 does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with Variation S5-A2, Variation S5-A1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S5-A2

Variation S5-A2 does not cross any streams that support special status fish species or protected fish habitats. No identifiable impacts from this variation are anticipated.

Federally Listed and Candidate Fish Species

As with Variation S5-A1, Variation S5-A2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

As with Variation S5-A1, Variation S5-A2 does not cross any streams that support sensitive fish species. No identifiable impacts from this variation are anticipated.

Protected Fish Habitats

As with Variation S5-A1, Variation S5-A2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S5-B1

Variation S5-B1 does not cross any streams that support federally listed or candidate fish species. However, Variation S5-B1 crosses the Owyhee River, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S5-B2, Variation S5-B1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S5-B1 crosses the Owyhee River, which supports redband trout. Vegetated riparian zones at this stream crossing is approximately 50 feet. Based on the impact criteria used in this analysis (Table 3-196), the Variation S5-B1 is anticipated to result in approximately 0.6 mile of low, residual impacts on redband trout. Variation S5-B1 is anticipated to result in approximately 0.4 mile of greater impacts on redband trout than Variation S5-B2.

Protected Fish Habitats

As with Variation S5-B2, Variation S5-B1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S5-B2

Variation S5-B2 does not cross any streams that support federally listed or candidate fish species. However, Variation S5-B2 crosses the Owyhee River, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S5-B1, Variation S5-B2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S5-B2 crosses the Owyhee River, which supports redband trout. Vegetated riparian zones at this stream crossing is approximately 50 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S5-B2 is anticipated to result in approximately 0.2 mile of low, residual impacts on redband trout. Variation S5-B2 is anticipated to result in approximately 0.4 mile of fewer impacts on redband trout than Variation S5-B1.

Protected Fish Habitats

As with Variation S5-B1, Variation S5-B2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Malheur S Alternative

The Malheur S Alternative does not cross any streams that support federally listed or candidate fish species. However, similar to the Applicant's Proposed Action Alternative, the Malheur S Alternative crosses the Owyhee River, Bully Creek, Cottonwood Creek, and the Malheur River, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Malheur S Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

Similar to the Applicant's Proposed Action Alternative, the Malheur S Alternative crosses the Owyhee River, Bully Creek, Cottonwood Creek, and the Malheur River, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Malheur S Alternative is anticipated to result in approximately 0.5 mile of low, residual impacts on redband trout. The Malheur S Alternative is anticipated to result in approximately 0.6 mile of fewer impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Malheur S Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Malheur A Alternative

The Malheur A Alternative does not cross any streams that support federally listed or candidate fish species. However, similar to the Applicant's Proposed Action Alternative, the Malheur A Alternative crosses the Owyhee River, Bully Creek, Cottonwood Creek, and the Malheur River, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with the Applicant's Proposed Action Alternative, the Malheur A Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this alternative are anticipated.

Sensitive Fish Species

Similar to the Applicant's Proposed Action Alternative, the Malheur A Alternative crosses the Owyhee River, Bully Creek, Cottonwood Creek, and the Malheur River, which support redband trout. Vegetated riparian zones at these streams vary from approximately 50 feet to 100 feet. Based on the impact criteria used in this analysis (Table 3-196), the Malheur A Alternative is anticipated to result in approximately 0.5 mile of low, residual impacts on redband trout. The Malheur A Alternative is anticipated to result in approximately 0.6 mile of fewer impacts on redband trout than the Applicant's Proposed Action Alternative.

Protected Fish Habitats

As with the Applicant's Proposed Action Alternative, the Malheur A Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this alternative are anticipated.

Conclusion

None of the alternative routes in Segment 5 cross streams that support ESA-listed fish, critical habitat, and/or EFH; however, all of the alternative routes in Segment 5 cross streams that support redband trout. Low residual impacts are anticipated where streams that support redband trout are crossed. The Applicant's Proposed Action Alternative is anticipated to result in greater residual impacts on fish

resources than the other alternative routes as a greater distance of streams that support redband trout are crossed.

SEGMENT 6—TREASURE VALLEY

The alternatives in Segment 6 cross numerous waterways with fish presence, construct new access roads, remove riparian vegetation, and control noxious weeds through herbicide use.

The number or locations of access road crossings will not be available until a route is selected for construction and final design and engineering is completed. However, the construction of new access roads and the upgrades of existing access roads can cause the loss of streamside vegetation, increased sedimentation or pollution runoff to waterways, potential blockage of fish passage, and loss of necessary habitat over the life of the B2H Project.

Waterways within Segment 6 do not support ESA-listed fish, designated critical habitat, and/or EFH; however, waterways within Segment 6 do support special status fish species. For perennial fish-bearing waterways within Segment 6, existing structures would be used when feasible; however, new or modified channel-spanning structures may be used where required. For seasonal/ephemeral streams, new or modified channel-spanning structures, existing fords, or existing fords that require minor modifications to stabilize (e.g., portable mats, minimal amount of coarse fill) would be used.

Also, short segments of new access roads that do not cross a waterway would be constructed within RCAs of waterways that support special status fish species.

The differences in impacts on fish resources between the alternatives and variations within Segment 6 are mainly related to the number of stream crossings and the extent of vegetation removal that would be required.

Table 3-220 presents the residual impacts on all alternative routes and route variations in Segment 6.

Table 3-220. Fish Resources Inventory Data and Residual Impacts for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Inventory Data (miles crossed)					Residual Impacts (miles crossed)		
		Bull Trout Critical Habitat	Chinook Salmon Critical Habitat	Middle Columbia River Steelhead Critical Habitat	Snake River Basin Steelhead Critical Habitat	Redband Trout Occupied Streams	None	Low	Moderate
Applicant's Proposed Action	28.0	0.0	0.0	0.0	0.0	0.8	27.2	0.8	0.0
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*9.2*	*0.1*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*8.8*	*0.1*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*14*	*0.4*	*0.0*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*13.7*	*0.4*	*0.0*

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. However, the Applicant's Proposed Action Alternative crosses Succor Creek, Reynolds Creek, and Jump Creek, which support redband trout. These crossings would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

The Applicant's Proposed Action Alternative does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this action are anticipated.

Sensitive Fish Species

The Applicant's Proposed Action Alternative crosses Succor Creek, Reynolds Creek, and Jump Creek, which support redband trout. Vegetated riparian zones at these streams vary from approximately 100 feet to 200 feet. Based on the impact criteria used in this analysis (Table 3-196), the Applicant's Proposed Action Alternative is anticipated to result in approximately 0.8 of low, residual impacts on redband trout.

Protected Fish Habitats

The Applicant's Proposed Action Alternative does not cross any streams that support protected fish habitats. No identifiable impacts from this action are anticipated.

Variation S6-A1

Variation S6-A1 does not cross any streams that support federally listed or candidate fish species. However, Variation S6-A1 crosses Poison Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S6-A2, Variation S6-A1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S6-A1 crosses Poison Creek, which supports redband trout. Vegetated riparian zones at this stream are approximately 100 feet to 300 feet. Based on the impact criteria used in this analysis

(Table 3-196), Variation S6-A1 is anticipated to result in approximately 0.1 mile of low residual impacts on redband trout. Variation S6-A1 is anticipated to result in similar impacts on redband trout as Variation S6-A2 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variation S6-A2, Variation S6-A1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S6-A2

Variation S6-A2 does not cross any streams that support federally listed or candidate fish species. However, Variation S6-A2 crosses Poison Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S6-A1, Variation S6-A2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S6-A2 crosses Poison Creek, which supports redband trout. Vegetated riparian zones at this stream are approximately 100 feet to 300 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S6-A2 is anticipated to result in approximately 0.1 mile of low residual impacts on redband trout. Variation S6-A2 is anticipated to result in similar impacts on redband trout as Variation S6-A1 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variation S6-A1, Variation S6-A2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S6-B1

Variation S6-B1 does not cross any streams that support federally listed or candidate fish species. However, Variation S6-B1 crosses Jump Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S6-B2, Variation S6-B1 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S6-B1 crosses Jump Creek, which support redband trout. Vegetated riparian zones at this stream crossing are approximately 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S6-B1 is anticipated to result in approximately 0.4 mile of low residual impacts on redband trout. Variation S6-B1 is anticipated to result in similar impacts on redband trout as Variation S6-B2 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variation S6-B2, Variation S6-B1 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Variation S6-B2

Variation S6-B2 does not cross any streams that support federally listed or candidate fish species. However, Variation S6-B2 crosses Jump Creek, which supports redband trout. This crossing would result in removal of tall vegetation that would decrease shading, potentially resulting in increased stream temperatures and sediment load. The types of potential effects on fish resources are described in more detail in Section 3.2.5.6. Design features of the B2H Project for environmental protection and selective mitigation measures that would minimize impacts on fish resources include spanning of riparian communities and water courses, using existing access roads, selective removal of vegetation, and others (refer to Table 3-201). Resource-specific consequences are discussed further below.

Federally Listed and Candidate Fish Species

As with Variation S6-B1, Variation S6-B2 does not cross any streams that support federally listed or candidate fish species. No identifiable impacts from this variation are anticipated.

Sensitive Fish Species

Variation S6-B2 crosses Jump Creek, which supports redband trout. Vegetated riparian zones at this stream crossing are approximately 100 feet. Based on the impact criteria used in this analysis (Table 3-196), Variation S6-B2 is anticipated to result in approximately 0.4 mile of low residual impacts on redband trout. Variation S6-B2 is anticipated to result in similar impacts on redband trout as Variation S6-B1 except impacts will occur at different stream crossing locations.

Protected Fish Habitats

As with Variation S6-B1, Variation S6-B2 does not cross any streams that support protected fish habitats. No identifiable impacts from this variation are anticipated.

Conclusion

The Applicant's Proposed Action Alternative does not cross streams that support ESA-listed fish, critical habitat, and/or EFH; however, it does cross streams that support redband trout. Low residual impacts

are anticipated where streams that support redband trout are crossed. For each variation option, the variations cross the same streams that support redband trout for the same distance, therefore residual impacts on fish resources are anticipated to be similar with any of the Applicant's Proposed Action Alternative route variation options.

3.2.6 LAND USE

3.2.6.1 INTRODUCTION

This section describes land uses of the region within eastern Oregon and western Idaho that would be affected by the proposed B2H Project. These resources are grouped into seven subsections: Land ownership, utility corridors, and parallel facilities; existing land use; timber management; fire management; zoning; military training; and specially designated areas. The regulatory framework, issues identified for analysis, methods, affected environment, and environmental consequences are described for each resource.

Issues raised by the public and agencies during B2H Project scoping and preparation of the EIS, related to potential impacts on land uses, are identified and evaluated by alternative route in this section.

To improve readability, some resources related to land use in the B2H Project area have been moved into separate sections in Chapter 3, including:

- Agriculture (Section 3.2.7)
- Recreation (Section 3.2.8)
- Transportation (Section 3.2.9)
- Lands with Wilderness Characteristics (Section 3.2.10)
- Potential Congressional Designations (Section 3.2.11)

3.2.6.2 REGULATORY FRAMEWORK

Various regulatory systems are in place throughout the B2H Project area that direct management to all levels of jurisdiction (federal, state, and local). The regulatory framework for this project is broken out by federal, state, and local.

FEDERAL

Land uses on federal lands in the analysis area are governed by various land-use plans, including three BLM RMPs, one U.S. Forest Service (USFS) Land and Resource Management Plan (LRMP), one Reclamation RMP, and one Department of Defense (U.S. Department of Navy [Navy]) plan. These plans establish management goals, objectives, and standards for the BLM, USFS, Reclamation, and Department of Defense management units. In areas where a transmission line is inconsistent with some portion of a plan, the transmission line may be prohibited, or an amendment to the plan may be needed to approve the B2H Project. Proposed plan amendments that may be necessary to approve the B2H Project are discussed in Section 3.4, Plan Amendments.

Public lands are managed for all citizens under various laws and plans. Therefore, everyone gets the benefit and the consequences of a project. Public lands provide natural resources that could be affected by the location of the transmission line (such as wildlife and habitat; visual, cultural, and historical resources). Both the USFS and BLM derive their authority to locate transmission lines on

public land under the FLPMA. This act explicitly permits the issuance of right-of-way under Title V. Decisions on issuing a right-of-way grant or a special-use authorization must also consider national and state land-use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices.

Other federal lands in the analysis area are governed by utility corridors and tribal rights and interests, which also are discussed in this section.

Table 3-221 identifies administrative units and applicable plans in the B2H Project area.

Table 3-221. Federal Resource Management Plans and U.S. Forest Service Land Resource Management Plan

Administrative Unit	Applicable Plan Name	Plan Year
BLM Idaho, Boise District, Owyhee Field Office	Owyhee RMP, and current amendments	1999
BLM Oregon, Vale District, Malheur Field Office	Southeastern Oregon RMP	2002
BLM Oregon, Vale District, Baker Field Office	Baker RMP[1]	1989
Wallowa-Whitman National Forest	Wallowa-Whitman National Forest LRMP	1990
Bureau of Reclamation	Owyhee Reservoir RMP	1994
U.S. Department of the Navy	Integrated Natural RMP Weapons Systems Training Facility Boardman	2012
Current Plan Amendments		
Applicable to Owyhee, Baker and Vale RMP	Approved Resource Management Plan Amendments/Record of Decision for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in 11 Western States	2009
Applicable to Owyhee, Baker and Vale RMP	Record of Decision and Approved Resource Management Plan Amendments for the Great Basin Region, Including the Greater Sage-Grouse Sub-Regions of Idaho and Southwestern Montana, Nevada and Northeastern California, Oregon, Utah	2015
Applicable to Owyhee RMP	Omnibus Public Land Act 2009, Public Law 111-11 3/20/2009	2009

Table Notes:
[1]The Baker RMP is currently under revision.
BLM = Bureau of Land Management
RMP = resource management plan
LRMP = land and resource management plan

BLM Resource Management Plans

The BLM land-use planning process (43 CFR 1610) is subject to Section 202 of the FLPMA of 1976 and NEPA of 1973 regulations. The BLM RMPs provide land-use planning and management direction on a broad scale and guide actions on BLM-administered lands. Land-use plan decisions consist of desired outcomes (goals and objectives) and allowable uses and management actions. Land-use plans are used by managers to allocate resources and determine appropriate multiple uses for public lands,

develop a strategy to manage and protect resources, and set up systems to monitor and evaluate status of resources and the effectiveness of management practices over time.

Land-use plans and planning decisions are the basis for every on-the-ground action the BLM undertakes. Land-use plans ensure public lands are managed under the principles of multiple use and sustained yield. As required by FLPMA and BLM policy, public lands must be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water-resource, and archaeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; that will provide for outdoor recreation and human occupancy and use; and that recognizes the nation's need for domestic sources of minerals, food, timber, and fiber from public lands by encouraging collaboration and public participation throughout the planning process (BLM 2015).

The B2H Project would cross BLM-administered lands managed under the Baker RMP in Oregon (BLM 1989), the Southeastern Oregon RMP in Oregon (BLM 2002), and Owyhee RMP in Idaho (BLM 1999).

Baker Resource Management Plan

The Baker RMP/ROD (BLM 1989) provides direction for managing public lands under the jurisdiction of the Vale District Office within the Baker Field Office. The RMP planning area encompasses approximately 429,754 acres bordered by the Snake River to the east, the Oregon– Washington state line and the Columbia River to the north, and by Gilliam, Wheeler, Grant, and Malheur counties to the west and south.

The lands managed under the Baker RMP include a forestland base of 88,603 acres; 29,330 acres are commercial forestland and 59,273 acres are woodlands. Grazing permits/leases are authorized for 55,437 animal unit months of livestock forage on 418,601 acres (374 allotments). Off-highway vehicle (OHV) designations are approximately 81,830 acres open, 319,853 acres limited, and 30,834 acres closed.[1] Nine areas totaling 38,988 acres are designated as ACECs; one area is designated as an outstanding natural area, and one as an RNA. The plan includes provisions to protect or enhance cultural resources, soil, water resources, botanical resources, visual resources, recreational opportunities, and other resources.

Fire Management

RMP management direction is to implement full suppression on fires that threaten high values at risk, such as private property, improvements, and areas with unique and/or special resource values. In addition, modified suppression will be implemented, through escaped fire analysis, on areas with lower values at risk and that are not covered by prescribed fire plans (BLM 1989). The RMP provides for a prescribed fire program, in consideration of current conditions and other resources.

[1]The OHV management designation numbers used for the Baker Field Office are approximate based on current BLM ownership lands, and have been updated based on the Sage-Grouse RMP Amendments. The data used for this analysis does not include lands withdrawn from BLM for use by other federal agencies.

Southeastern Oregon Resource Management Plan

The Southeastern Oregon RMP (BLM 2002) provides direction for managing public lands within the Malheur field office of the BLM Vale District. The Southeastern Oregon RMP planning area covers approximately 4.6 million acres of BLM-administered land mainly located in Malheur County, with some lands in Grant, Harney, and Baker counties. The planning area is bounded on the east by Idaho, on the south by Nevada, on the north by the Vale District's Baker Field Office, and on the west by the BLM Burns District's Three Rivers and Andrews Field Offices. Most of the public land is contiguous, with some scattered or isolated parcels.

The RMP includes provisions to improve or maintain upland conditions (including forest, woodland, and rangeland), riparian conditions, fish and wildlife habitat, botanical resources, and special status species.

The Southeastern Oregon RMP establishes guidance for managing a broad spectrum of land uses and allocations, including livestock grazing management (168 allotments), wild horse herd/management areas (17 areas), land-tenure adjustments, OHV designations (approximately 15,828 acres closed, 4,236,406 acres limited, and 359,542 acres open) 32 WSAs, 4 suitable National Wild and Scenic Rivers (WSR) (42.5 miles), 28 ACECs/RNAs (206,905 acres), caves, historic interpretive sites and districts, national trails, and other areas of national significance. Approximately 4,407 acres of forestland are available for commercial timber harvest, and 124,500 acres of western juniper are available for treatment to restore presettlement conditions. Approximately 5,877 acres of forested land are managed to preserve or create old-growth forest characteristics. The Southeastern Oregon RMP also designates new utility corridors ranging from 500 to 6,000 feet on each side of the centerline of existing facilities.

Fire Management

Management direction in the 2002 RMP is to provide appropriate management response on all wildfires. Response is to be based on preplanned fire criteria, resource objectives, and constraints as identified in Appendix M of the approved district fire management plan (FMP). As needed, the existing FMP should be modified to reflect changes in resource objectives and constraints (BLM 2002:37). The RMP provides for a prescribed fire program, and recognizes that fire is a critical natural process that can be used for the benefit of resources in appropriate conditions.

BLM Vale District Fire Management Plan

The purpose of the FMP is to describe how fire management strategies and tactics will protect values and provide tools to meet resource goals and objectives. The FMP tiers to decisions made in the Southeast Oregon (SEORMP), the Historic Baker Resource Management Plan, the Oregon Greater Sage-Grouse ARMPA, and the Wallowa-Whitman National Forest Land and Resource Management Plan. Development of FMPs is required by the *2009 Guidance for Implementation of Wildland Fire Management Policy*. This plan has been prepared on the foundational principle that firefighter and public safety is the first priority in every fire management activity.

This FMP describes fire management strategies and operations for the Bureau of Land Management's Vale District administered land and Wallowa-Whitman National Forest Service land protected by the Vale BLM. This FMP was developed using land-use plan direction, including goals and objectives

across all disciplines. All plans provide broad programmatic fire management direction. The intent of fire and fuels management actions is to reduce fire severity and frequency, as well as to restore resiliency by improving vegetative condition. These management actions are consistent with maintaining and improving wildlife habitat and rangeland health, as well as providing for firefighter and public safety.

Owyhee Resource Management Plan

The area managed under the Owyhee RMP (BLM 1999) is bounded on the west by Oregon, on the south by Nevada, on the north by the Snake River, and on the east by Castle Creek, Deep Creek, the Owyhee River, and Duck Valley Indian Reservation. Most of the public lands are contiguous, with only a few scattered or isolated parcels. Approximately 1,320,032 acres are managed by the BLM under the Owyhee RMP. The resource area includes the northern extent of the Owyhee Mountain Range and lies within what is often referred to as the Columbia Plateau, an elevated plateau with mountains separated by canyons draining to the Pacific Ocean via the Snake and Columbia rivers.

The Owyhee RMP establishes guidance for managing a broad spectrum of land uses and allocations, including livestock grazing management (153 allotments, 135,116 AUMs, and 1,605,155 acres), wild-horse management, land-tenure adjustments, OHV designations (258,904 acres closed, 1,000,791 acres limited, and 194 acres open), 6 designated WSRs (136 miles), wilderness areas (243,750 acres), and 13 ACECs (167,372 acres). The RMP contains resource objectives, land-use allocations, management actions, and direction needed to achieve program and multiple-use goals.

Public lands within the resource area are available for transportation and utility rights-of-way except where specifically prohibited by laws or regulations (such as wilderness areas) and in areas specifically identified as avoidance and exclusion areas to protect high-resource values.

Fire Management

RMP direction is to “Suppress wildfires by taking the appropriate management response using the range of acceptable acreage limits listed for each fire management zone within the resource area.” The appropriate response should consider resource values, firefighter safety, and costs, and whether allowing natural fires to burn would meet resource objectives (BLM 1999). The current FMP is reviewed periodically and may be revised in conformance with the RMP objectives.

Fire Management Plan, Southwestern Idaho Fire Planning Unit

The FMP (BLM 2011) incorporated the management direction from the Owyhee RMP. It does not provide additional direction. It does divide the area into fire management units, sets protocols for all and individual units, and identifies suppression priorities and fuel treatment priorities.

USFS Land and Resource Management Plans

A LRMP provides direction for all resource management activities on a national forest. An approved LRMP is the product of a process established by Congress in the National Forest Management Act 1976. A LRMP allocates land for timber production, oil and gas leasing, and other resource management activities. It designates areas for recreation and recommends the establishment of

wilderness, WSRs, and other special designations. The LRMP describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management. The management direction provided by the LRMP comprises the framework within which project planning and activities take place. USFS plans establish standards for resource management, either Forest-wide or for specific management areas.

Wallowa-Whitman National Forest Land and Resource Management Plan

The Wallowa-Whitman National Forest includes more than 2.3 million acres of land in northeastern Oregon. The Wallowa-Whitman National Forest LRMP (USFS 1990) guides natural resource management activities for the Wallowa-Whitman National Forest, those portions of the Nez Perce and Payette National Forests that are administered by the Wallowa-Whitman National Forest, and other lands within the Hells Canyon National Recreation Area. The LRMP was developed under a process established by the National Forest Management Act. The LRMP establishes Forest-wide multiple-use goals and objectives; Forest-wide standards and guidelines; and sets prescriptions, standards, and guidelines for each management area identified in the LRMP.

The Wallowa-Whitman National Forest includes two wilderness areas, plus portions of two others, for a total designated wilderness of 582,700 acres (approximately 25 percent of the Forest). There are 10 WSRs on the Wallowa-Whitman National Forest for 269 miles. Of the 2.3 million acres of this national forest, approximately 1.3 million acres (57.5 percent of the forest) are classified as suitable for livestock grazing. About 1.09 million acres (46 percent of the Wallowa-Whitman Forest) are classified as suitable for timber management. Approximately 173,000 acres on the Wallowa-Whitman National Forest comprise 131 specifically defined areas varying in size from 100 to 3,000 acres that are managed for old-growth forest conditions. The Wallowa-Whitman Forest includes approximately 9,300 miles of road (7,000 miles of which are open for use), 2,900 miles of winter and summer trails, and 5 landing strips. The LRMP states that when applications for rights-of-way for utilities are received, the Forest's first priority will be to utilize residual capacity in existing rights-of-way. Additional utility rights-of-way or corridors may be identified and approved subject to site-specific environmental analysis (USFS 1990).

Timber Management

Timber management includes the commercial and non-commercial harvest of forest wood products. Harvestable trees from conifer forests are generally referred to as timber. Besides lumber, timber products also include poles, posts, firewood, and Christmas trees. Harvest of these products is often included in timber or forest management programs. Additional discussion of forest vegetation communities is presented in Section 3.2.3.

All timber cleared from the right-of-way on National Forest System land would be cut and cleared in accordance with standards and guidelines in the Wallowa-Whitman LRMP. Merchantable timber cut on National Forest System land would be disposed of as described in 36 CFR 223.12 or as required by the USFS. Clearing on BLM-managed forested land would meet requirements of the applicable RMP. Forested areas outside the right-of-way that are disturbed by the project (such as by temporary roads

and fly yards) would be replanted according to federal (e.g., BLM and USFS) and state requirements (e.g., Oregon Reforestation Rules, OAR 629-610-0000 through 629-610-0090).

Fire Management

Wildfire control priorities give the highest priority for aggressive suppression action to wildfires that threaten life, private property, public safety, improvements, or investments.

Bureau of Reclamation Resource Management Plans

Reclamation's RMPs provide a guide for creating a balance for resource development, recreation, and protection of natural and cultural resources for the lands and waters they manage.

Owyhee Reservoir Resource Management Plan

The Owyhee Reservoir RMP (Reclamation 1994) defines the resource management activities and guidelines needed to preserve and protect the existing land and water resources administered by Reclamation in the vicinity of the Owyhee Reservoir in Malheur County, Oregon. The RMP planning area includes approximately 26,190 acres of land and 12,740 acres of water surface (at full-pool elevation of 2,670 feet) comprising lands adjacent to the Owyhee Reservoir and parts of the Owyhee River system above and below the reservoir.

The RMP was developed in cooperation with several other agencies to balance desired public recreational uses of Reclamation lands and waters with the protection and improvement of existing resources specific to the Owyhee Reservoir study area. The Owyhee Reservoir provides irrigation water to 118,249 acres, which encompass 1,845 farm units and 8 towns in Malheur County, Oregon, and Owyhee County, Idaho. Land-use agreements have allowed for the establishment of the Owyhee State Park, the Lake Owyhee Resort, and the Pelican Point Airstrip along with other recreational activity sites within the RMP study area.

In addition, hydroelectric power generating facilities were developed in the 1980s on the Owyhee Project and Reclamation obtained Federal Energy Regulatory Commission licenses to construct and operate three power plants. These included a 5,000 kilowatt power plant at Owyhee Dam, using power outlet facilities installed during dam construction, an 8,000 kilowatt power plant at Tunnel No. 1, the major diversion works for the Owyhee Project, and a 2,000 kilowatt power plant on the Mitchell Butte Lateral. These powerplants were placed in operation between 1985 and 1993 (Reclamation 2013).

Fire Management

Reclamation is not directly responsible for fire suppression on the Owyhee Reservoir lands it administers. The RMP adopts fire-suppression policies established by the BLM for surrounding lands. The RMP also includes measures to limit fire risk.

The Vale Project

The Bureau of Reclamation Vale Project lands are located along the Malheur River and Willow Creek in east-central Oregon, surrounding the town of Vale. The project furnishes irrigation water to 35,000 acres of land. Features include Agency Valley Dam and Beulah Reservoir, Bully Creek Dam and

Reservoir, Harper Diversion Dam, Vale Main Canal, and a distribution and drainage system. This water supplies lands on the west side of the Malheur River from Lime to Vale, and along Willow Creek from Vale to the vicinity of Jamieson, Oregon. A siphon, 1.5 miles southwest of Little Valley, conveys water to the Little Valley Canal, on the east side of the Malheur River in the vicinity of Little Valley. Excess water from the Malheur River is diverted to Bully Creek Reservoir through the Vale Main Canal, and through the Bully Creek Feeder Canal that delivers water from the Main Canal, heading about 8 miles west of Vale, Oregon. Water stored in Bully Creek Reservoir is delivered by two laterals, one beginning at the outlet works of the dam and the other at Bully Creek Diversion Dam about a mile downstream from the reservoir.

Utility Corridors

There are two types of designated utility corridors in the B2H Project area: the DOE West-Wide Energy Corridor and individual federal agency RMP and LRMP corridors. Utility corridors are designated in LUP Amendments and the West-Wide Energy Corridor Records of Decision (BLM 2009; USFS 2009). These corridors are shown on MV-12, Land Status.

West-Wide Energy Corridors

In response to Section 368 of the Energy Policy Act of 2005, a Programmatic EIS has been developed for West-Wide Energy Corridor corridors in the 11 western states (Washington, Oregon, Idaho, Montana, Wyoming, California, Nevada, Utah, Colorado, Arizona, and New Mexico). The DOE and the BLM were the lead federal agencies, and the USFS and other agencies were cooperators for the designation of energy corridors on federal land in 11 western states (DOE/EIS-0386). A final Programmatic EIS was published on November 28, 2008 (DOE and BLM 2008). The West-Wide Energy Corridor Records of Decision for the BLM and USFS signed January 14, 2009, designate energy corridors and provide guidance, interagency operating procedures (IOPs), and mitigation measures to be used where linear facilities are proposed crossing public lands. Where the Programmatic EIS identifies new corridors for the managing agencies, the BLM and USFS RODs also amend relevant land management plans to include the new corridor. The designation of corridors does not require their use, nor does such designation exempt federal agencies from conducting an environmental review on each project. The BLM's West-Wide Energy Corridor ROD amended the Baker RMP, the Southeastern Oregon RMP, and the Owyhee RMP by designating two West-Wide Energy Corridors. West-Wide Energy Corridor 11-228 follows an existing 500-kV transmission line in Owyhee and Malheur counties. West-Wide Energy Corridor 250-251 generally parallels I-84 in Malheur and Baker counties.

A settlement agreement filed July 3, 2012, in the federal case *The Wilderness Society et al. v. United States Department of Interior et al.*, No. 3:09-cv-03048-JW (N.D. Cal.) provides for periodic review of West-Wide Energy Corridors identified in the final Programmatic EIS. The agreement also provides for periodic review and update of the IOPs contained in the ROD, so the IOPs identified for implementation in the Final Boardman to Hemingway EIS may differ from those presented in this Draft EIS. In addition, based on comments received on the Draft EIS, design features of the B2H Project for environmental

protection (which include the West-Wide Energy Corridor IOPs) and selective mitigation measures are included in the Final EIS (Section 2.5.1.1).

In addition, on May 20, 2016, the BLM, DOE, and USFS began a corridor study that will provide the foundation for additional study and review of the West-Wide Energy Corridors. The corridor study evaluates whether the West-Wide Energy Corridors are achieving their purpose to promote environmentally responsible corridor-siting decisions and reducing the proliferation of dispersed rights-of-way crossing federal lands. The corridor study provides baseline data and identifies considerations and areas which should be explored in more detail during the future required Regional Periodic Reviews conducted by BLM and USFS.

Resource Management Plan and Land and Resource Management Plan Designated Corridors

Some federal and county land-use plans require the use of existing rights-of-way or designated utility corridors for new utility projects. Section 503 (43 U.S.C. 1763) of the FLPMA encourages the BLM and USFS to use existing corridors to the extent practical to minimize adverse environmental impacts and the proliferation of separate rights-of-way. Per county codes and/or ordinances, Malheur, Umatilla, and Union counties encourage the development of transmission lines on existing transmission line rights-of-way wherever possible.

Department of Defense Management Plans

Naval Weapons System Training Facility Boardman Integrated Natural Resources Management Plan and Final EIS

The U.S. Department of Defense (DoD), with the assistance of the U.S. Fish and Wildlife Service (FWS) and the states, is responsible under the Sikes Act (16 U.S.C. 670a-670f, as amended) for carrying out programs and implementing management strategies to conserve and protect biological resources on its lands. Because military lands and waters often are protected from human access and impact, they contain some of our nation's most significant remaining large tracts of land with valuable natural resources.

Congress established the Sikes Act in 1960 to manage these lands for wildlife conservation and human access. The Sikes Act was amended in 1997 to develop and implement mutually agreed upon Integrated Natural Resource Management Plans (INRMP) through voluntary cooperative agreements between the DoD installation, USFWS, and the respective state fish and wildlife agencies. INRMPs are planning documents that allow DoD installations to implement landscape-level management of their natural resources while coordinating with various stakeholders. They are extremely important management tools that ensure military operations and natural resources conservation are integrated and consistent with stewardship and legal requirements.

The Navy adopted the NWSTF Boardman INRMP in January 2012 (Navy 2012). This plan is used to guide the installation commander (Command of Naval Air Station Whidbey Island) in the management of natural resources to support the installation mission, while protecting and enhancing installation resources for multiple use. In addition, as a separate effort, the ROD for the NWSTF Boardman was published in April 2016. The Proposed Action for the NWSTF Boardman EIS would result in increases

in training activities and development of necessary ranges, range facilities, and range. The Proposed Action does not include changes to or expansion of the existing NWSTF Boardman boundaries.

In addition, the Navy has provided information to the Applicant indicating that similar conditions as those identified in the existing use agreement in place for the Bonneville Power Administration (BPA) 69-kV line would apply to the B2H Project as they are both aboveground utilities along a similar easement corridor (M. Vaughn, Idaho Power Company, email communication with author, 2016).

Tribal Rights and Interests

The federal government has a unique and distinctive relationship with tribes as set forth in the Constitution of the U.S., treaties, statutes, Executive Orders, judicial decisions, and agreements. The U.S. Government has a trust responsibility to federally recognized Native American tribes that covers lands, resources, money, or other assets held by the federal government in trust and the ability of those tribes to exercise their tribal rights. The U.S. recognizes Native American tribes as sovereign nations.

Tribal concerns regarding land use are focused on the tribe's ability to continue traditional land uses under treaty rights and inherent rights to lands within the B2H Project area. The tribes maintain active interests in the planning area and use public lands to gather plants or other native materials.

The Native American tribes present within the B2H Project study area include Burns Paiute Tribe, Confederated Tribes of the Colville Reservation, CTUIR, Confederated Tribes of the Warm Springs Indian Reservation of Oregon, Fort McDermitt Paiute and Shoshone Tribe, Joseph Band of the Nez Perce, Nez Perce Tribe, Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, Yakama Nation.

The tribes consider portions of the B2H Project area to be part of their aboriginal territory, subsistence range, traditional use area, or zone of influence. Exercise of treaty rights could include hunting, fishing, gathering, pasture rights, water rights, and mineral rights on federal lands outside of the boundaries of their reservations. Refer to Section 3.2.14 for further detail regarding Native American concerns.

In addition to BLM consultation with Native American sovereign tribal governments described in Section 3.3.4.14 Native American Concerns; analysis was conducted in accordance with Executive Order No. 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994. Refer to Section 3.2.17 for further detail.

Indian Reservations

The Umatilla Indian Reservation is located within the B2H Project area in Umatilla County, Oregon. Land use on the Umatilla Indian Reservation is governed by the Land Development Code. However, since the B2H Project does not cross any Native American reservations the Land Development Code would not govern the placement of the transmission lines (refer to Section 3.2.14).

STATE

Oregon Statewide Local Planning Goals

ORS Chapter 197 directs Oregon counties to develop county comprehensive plans consistent with the applicable statewide planning goals developed by the Land Conservation and Development Commission. Each comprehensive plan is accompanied by a set of implementing measures. The two most common measures are zoning and land-division ordinances. Every city and county in Oregon has adopted such land-use controls. In addition, a system of statewide zoning was developed to help guide local counties and municipalities in developing land-use plans and ordinances. Nineteen statewide planning goals were defined, including three that are particularly relevant to transmission line location and are applicable in all five Oregon counties in which the B2H Project would be located. The applicable statewide planning goals and the substantive criteria of county plans and ordinances are discussed below.

Goal 3—Agricultural Lands

Goal 3 is designed to preserve and maintain agricultural lands for farm use. To comply with this goal, an applicant for a site certificate from EFSC must demonstrate compliance with applicable statutes (ORS 215.283 and 215.275) and Land Conservation and Development Commission administrative rules (OAR Chapter 660, Division 33) relating to exclusive farm use (EFU) lands. ORS 215.283 authorizes certain non-farm uses, including transmission lines, on EFU land provided the facilities are necessary for public service. Under ORS 215.275(1), a utility facility is "necessary for public service" if it must be sited in an EFU zone to provide service. To demonstrate necessity, an applicant must show that reasonable alternatives have been considered and that the facility must be sited on EFU-zoned land due to one or more of the following factors:

- Technical and engineering feasibility
- The proposed facility is locationally dependent; a utility facility is locationally dependent if it must cross land in one or more areas zoned for EFU to achieve a reasonably direct route or to meet unique geographical needs that cannot be satisfied on other lands.
- Lack of available urban and non-resource lands
- Availability of existing rights-of-way
- Public health and safety
- Other requirements of state or federal agencies

Goal 4—Forested Lands

The purpose of Goal 4 is to conserve forest lands. To comply with Goal 4, the Applicant must demonstrate compliance with Land Conservation and Development Commissions applicable rules set forth in OAR Chapter 660, Division 6. For transmission lines to be sited on forest lands, the use must meet the following requirements under the rules:

- The proposed use must not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands.

- The proposed use must not significantly increase fire hazard or significantly increase fire-suppression costs or significantly increase risks to fire-suppression personnel.
- The proposed use has the least impact on nearby or adjoining forest or agricultural lands.
- The siting ensures that adverse impacts on forest operations and accepted farming practices on the tract will be minimized.
- The amount of forest lands used to site access roads, service corridors, and structures is minimized.
- The risks associated with wildfire are minimized.

Goal 5—Natural Resources, Scenic and Historic Areas, and Open Spaces

The purpose of Goal 5 is to protect natural resources and conserve scenic and historic areas and open spaces. The guidelines identify the following as Goal 5 resources: riparian corridors, wetlands, wildlife habitat, federal WSRs, state scenic waterways, groundwater resources, approved Oregon recreational trails, natural areas, wilderness areas, mineral and aggregate resources, energy sources, and cultural areas. Generally, local governing bodies must inventory Goal 5 resources and provide for the preservation of natural areas consistent with the inventory of those resources that are historically, ecologically or scientifically unique, outstanding or important.

Oregon Energy Facility Siting Council

In Oregon, the EFSC, in coordination with the Oregon Department of Energy (ODOE), oversees the siting and construction of large energy facilities to ensure these facilities are located, built and operated in ways that protect the environment and public health and safety and ensure system reliability. EFSC is the primary state agency that approves or denies the application to build this facility in Oregon. It is a governor appointed citizen council that regulates energy facilities in Oregon. EFSC does not apply to private lands nor does it change federal agency authorization. The B2H Project must meet the EFSC's siting standards, and the EFSC must issue a site certificate for the facility before construction can occur. On issuance, the site certificate requires state agencies and local governments to issue all permits, licenses, and certificates for the construction and operations of the facility set forth for in the site certificate (ORS 469.401).

Before issuing a site certificate, EFSC must conclude that the project is consistent with Oregon's land-use policies as set forth in the statewide planning goals. The EFSC land-use standards are set forth in ORS 469.504 and OAR 345-022-0030. ORS 469.504 authorizes an applicant for a site certificate to choose between two methods for demonstrating compliance with the statewide planning goals: (1) by receiving approval for the facility from each affected local government (Path A) or (2) by electing to have EFSC make the necessary findings that the proposed facility will comply with the statewide planning goals (Path B). For the B2H Project, the Applicant has elected to demonstrate compliance with statewide planning goals by way of the second option or Path B.

Under Path B, EFSC must determine that the project complies with the following:

- Applicable Land Conservation and Development Commission rules and land-use statutes (including statewide planning goals)
- Any applicable, substantive criteria from each county's local comprehensive plan and land-use regulations.

In the EFSC process Path B review, the EFSC considers county and city land use and zoning requirements when evaluating a site certificate application. When the EFSC issues a site certificate, the affected counties and cities must issue permits and other approvals addressed in the site certificate, where required, subject only to the site certificate conditions. The EFSC relies on the affected local jurisdiction(s) to provide applicable substantive criteria and required permits based on the jurisdictions unique land-use ordinance requirements.

Oregon Department of State Lands

The Oregon Department of State Lands (Oregon DSL) manages nearly 771,000 acres of surface land and 800,000 acres of off-shore land, estuarine tidelands, and submerged and submersible lands of the navigable waterway system. It is responsible for administering the state's removal-fill law, which protects Oregon's waterways and wetlands from uncontrolled alteration. Its other responsibilities include leasing state-owned mineral rights for the exploration and production of oil, gas, hard minerals and geothermal energy; providing opportunities to lease or buy state land; maintaining historical records related to early land transactions, including deeds, leases, and plats; performing administrative functions for the Natural Heritage Advisory Council; managing oversight and the performance of administrative services for the South Slough National Estuarine Reserve; being the lead state agency for the protection and maintenance of Oregon's unique wetlands resources; and managing coastal resources seaward of the mean high-tide line. Proceeds from the management of lands and waterways and other activities of Oregon DSL become part of the Common School Fund principal.

Idaho Local Land-Use Planning Act

Idaho Code Title 67-65, Local Land Use Planning, requires all city and county governments to establish local planning procedures and land-use regulations. The Local Land Use Planning Act of 1975 requires every city and county to enact a comprehensive plan, zoning ordinance, subdivision ordinance, area of city impact ordinances, and regulations for confined animal feeding operations (counties only). The act also grants cities and counties the authority to adopt certain laws and policies at the discretion of the governing board. Local authorities have siting authority for transmission lines and substations (refer to the discussion for Owyhee County below).

Idaho Department of Lands

Idaho owns and manages more than 2 million acres of endowment lands that provide financial support to public schools and other institutions. The Idaho Department of Lands manages these trust lands under the governance of the Idaho Board of Land Commissioners, which consists of Idaho's governor, secretary of state, attorney general, superintendent of public instruction, and state controller. The land

board acts in the capacity of trustees on behalf of the beneficiary schools and other institutions to manage the state's endowment lands.

All endowment assets of Idaho, per the state constitution, must be managed in such manner as will secure the maximum long-term financial return to the trust beneficiaries. The State Trust Lands Asset Management Plan (Idaho State Board of Land Commissioners 2011) identifies utility and roadway rights-of-way as valid uses of endowment lands. However, any lease would need to be negotiated with the land board.

LOCAL

Through a public planning process, each county and city's comprehensive plan identified the goals and policies that guide the development of desired future conditions within its border. Each county within the B2H Project study area also adopted a development code that divides the land within its border into zones. Development codes (or zoning ordinances) regulate land-use activities, permitted uses of land, and intensity of development within each zone. Zoning ordinances are the county or city's primary regulatory mechanism to ensure that the future desired land-use conditions identified in the comprehensive plans are achieved. Zoning ordinances are used to guide and organize development within each county within the B2H Project area by separating incompatible land uses, directing development away from environmentally sensitive areas, and ensuring that development is adequately served by public infrastructure such as roads and utilities. The City of Boardman is the only cooperating city for the B2H Project.

Oregon Counties

Each Oregon County, in the B2H Project area, has a comprehensive plan and development code that governs land-use development. These include the following:

- Morrow County Comprehensive Plan (Morrow County 1986) and Morrow County Zoning Ordinance (Morrow County 2001)
- Umatilla County Comprehensive Plan (Umatilla County 1983a) and Umatilla County Development Code (Umatilla County 1983b)
- Union County Land Use Plan (Union County 1979) and Union County Zoning, Partition and Subdivision Ordinance (Union County 1983)
- Baker County Zoning and Subdivision Ordinance Number 83-3 (Baker County 1984) and Land Use Ordinances of 1983 (Baker County 2014)
- Malheur County Comprehensive Plan (Malheur County 1982) and Malheur County Zoning Ordinance (Malheur County 2008)

Where a project is not under the jurisdiction of EFSC or the project applicant elects to seek local approval outside of the EFSC process (Path A), each Oregon County would consider issuing a conditional-use permit after independent permit review. As described previously, the Applicant has elected to follow Path B, which means that issuance of a site certificate would bind state and local jurisdictions to the EFSC's action and would require them to issue permits, licenses, and certificates for

the construction and operations of the facility. To issue a site certificate, EFSC must conclude that the proposed facility will comply with the substantive criteria identified in the county plans and ordinances.

In response to the EFSC Notice of Intent 2008 and 2010 comment processes, all five Oregon counties identified substantive criteria they consider applicable to the proposed B2H Project (Appendix K):

- Morrow County letters to the ODOE dated December 8, 2008 and August 18, 2010
- Umatilla County letter to the ODOE dated September 15, 2010
- Union County letters to the ODOE dated October, 2008 and January 2011
- Baker County letters to the ODOE dated December 5, 2008 and September 22, 2010
- Malheur County letters to the ODOE dated December 2, 2008 and December 8, 2010

While each county has specific concerns, common general plan themes include, but are not limited to, the following:

- Protection of EFU, Exclusive Range Use (ERU), grazing/farmland, and timber-grazing zones
- Establishment of setbacks from streams
- Protection of Goal 5 resources (natural resources, scenic and historic areas, and open spaces)
- Prevention of flood damage by implementing flood hazard zones
- Avoiding clearing in riparian areas
- Development compatibility with historic, archaeological, and cultural sites
- Protection of sensitive habitat wetland and big-game habitat
- Prevention of the spread of noxious weeds

The following counties are considered a Cooperator in the State of Oregon; Baker County, Malheur County, Umatilla County and Union County. The following counties are considered a Cooperator in the State of Idaho; Morrow County and Payette County,

Owyhee County, Idaho

The *Owyhee County Comprehensive Plan* (Owyhee County 2010a) was adopted in 2002 and amended in 2010. The county plan has an objective to encourage public utilities and utility corridors to be located on public lands. An energy goal in the Owyhee County Comprehensive Plan is to protect the property rights of Owyhee County citizens and not allow the infiltration of public utilities and energy corridors to negatively affect those citizens or their private property. Owyhee County adopted an Energy Plan (Owyhee County 2007) in 2007. The Energy Plan includes a policy to encourage the improvement of the power delivery system.

The *Owyhee County Zoning Ordinance* (Owyhee County 2010b) was adopted in 2010. Power generation, production and/or distribution facilities are permitted as conditional uses in the Agriculture (A), Multi-use (M), Residential (R), Commercial (C), and Industrial (I) zones.

3.2.6.3 Issues Identified for Analysis

Issues related to land use were raised by the public, Native American tribes and federal and state agencies during scoping. The list below is a summary of the issues identified during scoping that are analyzed in this section of the EIS, as well as issues that must be considered as required by applicable laws or regulations. A list of public comments received on the Draft EIS and responses can be found in Appendix K.

Land Ownership

- What kinds of effects would occur on Native American reservations? (Section 3.3.4.14)
- What forest plan and RMP amendments would be needed? (Section 3.4)
- Could the transmission line be constructed on public lands rather than private lands?

Utility Corridors

- Will the project be located in existing utility corridors?

Existing Land Use

- How much land area will be required for the project?
- Will increased access to the B2H Project area result in damage to land and resources?

Timber Management

- Would the B2H Project affect timber management and harvest?

Fire Management

- How would construction of the B2H Project and post construction reclamation affect fire risk?
- How would the B2H Project affect fire-suppression efforts, including aviation?

Zoning

- Is the Project consistent with local and county land-use plans?

Military Training

Issues related to military training were not identified during scoping. However, through coordination with NWSTF Boardman, the following issues were identified related to military training in NWSTF Boardman Special-use Airspace:

- Would the B2H Project cause conflict with three-dimensional training areas such as Weapons Danger Zone and Surface Danger Zones?
- Would ground activity associated with construction, operations, and maintenance of the B2H Project affect lands with Unexploded Ordinance?
- Would the B2H Project affect Washington Ground Squirrel Habitat located on NWSTF Boardman property? (Section 3.2.4)
- Would the B2H Project affect RNAs located on NWSTF Boardman property?
- Would the B2H Project affect overhead and underground utilities located adjacent to NWSTF Boardman and Bombing Range Road?

- Would the B2H Project affect historical, cultural, and archaeological resources located on NWSTF Boardman? (Section 3.3.4.13)
- Would the B2H Project affect Native American Resources? (Section 3.3.4.14)

Specially Designated Areas

- What effects will the B2H Project have on conservation and special-designation lands like areas of critical environmental concern?

3.2.6.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.3 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on major land-use categories.

DATA SOURCES

Land ownership, utility corridors, and parallel facilities were inventoried using readily available GIS data.

Existing land uses were inventoried using a combination of readily available GIS data for existing land use types, including the U.S. Geological Survey (USGS) National GAP Analysis Program Land Cover Data Set. The USGS GAP Land Cover Data Set includes detailed vegetation and land-use patterns for the continental U.S., and was used for the general identification of existing land uses. For a description of GAP land/vegetation classifications refer to Section 3.2.3.5. The GAP data was further complemented by other existing GIS data sets that included roads, linear utilities such as transmission lines, substations, power plants, and pipelines as well as a dataset of existing structures compiled by reviewing and interpreting aerial imagery.

All city and county comprehensive land-use plans and zoning ordinances occurring within the 1-mile-wide alternative route study corridors were inventoried and reviewed, as available. A generalized zoning data layer was created by interpreting the zoning or district designations within the city or county comprehensive plans and ordinances, and grouping them into similar categories. All areas with zoning designations that were similar were grouped, which resulted in the following general zoning classifications:

- **Agriculture**. Lands classified as agricultural include a diversity of farming land uses and activities that include dryland farmland, irrigated farmland, agriculture stockyards, out structures, fallow farmland, farm complexes, horse farms, and rangeland. Farming activities include the production of cultivated crops (e.g., wheat, barley, oats, corn, canola), field and truck crops (e.g., potatoes, green peas, asparagus, melons), hay and silage feeds (e.g., alfalfa, corn, pea vines), fruit products (e.g., apples, cherries, prunes, peaches, apricots, grapes), and an extensive livestock industry raising cattle and calves, hogs and pigs, sheep and lambs, and chickens and turkeys.

- **Industrial**. Lands classified as industrial are areas suitable and desirable for industrial activities such as warehouse businesses, manufacturing companies, major food processing facilities, forestry and wood products plants.
- **Grazing**. Lands classified as grazing are areas identified as suitable for ranching and domestic livestock grazing for commercial purposes.
- **Timber/Grazing**. Lands classified as timber/grazing are areas of private commercial forest lands; other forested lands needed for their watershed or wildlife and fisheries habitat value and recreation; lands whose sensitive nature requires the maintenance of vegetative cover; and other forested lands which provide visual and wind breaks, wildlife and fisheries habitat, livestock habitat, scenic corridors, and recreational use.
- **Commercial**. Lands classified as commercial are areas where goods and services are provided to the public. Commercial areas provide frequently needed goods and services, such as retail and grocery stores, banks, gas stations, and restaurants to local communities.
- **Public/Quasi-Public**. Lands classified as public/quasi-public areas are community centers, places of worship such as churches, and public parks and open spaces.
- **Residential**. Lands designated as residential are areas that vary in degree of housing density from low to high, and are typically designated as either single-family residential, multi-family residential (apartments), or rural residential.
- **Federal**. Federal lands throughout the B2H Project study area are managed by the BLM, USFS, Reclamation, or DoD, and guided by agency specific Land and Resource Management Plans.

Timber management, fire management, military training in NWSTF Boardman Special-use Airspace, and specially designated areas were inventoried using readily available GIS data.

These readily available GIS data were obtained from various materials and information provided by federal, state, and local agencies, including the following:

- BLM and USFS land and resource management plans
- Fire history and natural resource data hosted by the USGS
- City and county land-use plans
- Aerial photography (for structures)

For graphic representation of the locations of these land uses, refer to MV-12 through MV-15.

ANALYSIS AREA

All land-use categories were inventoried within a 1-mile-wide study corridor (i.e., 0.5 mile on either side of the reference centerline of the alternatives and route variations to identify land uses that could be affected both directly and indirectly by B2H Project construction, operation, and maintenance.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria were developed to assess the level of potential effects on land uses associated with implementation of the B2H Project (Table 3-222). The assessment of impacts on each category of existing land use, zoning, timber management, fire management, military training in NWSTF Boardman Special-use Airspace, other military special-use airspace, and specially designated areas was based on the relationship between the level of a potential effect on each use to estimated disturbance associated with B2H Project construction, operation, and maintenance.

Table 3-222. Criteria for Assessing Level of Impacts on Land-Use Resources

Level of Impacts	Description
High	• Areas where the B2H Project would conflict physically or create a direct long-term conflict with existing land uses, such as residential, commercial, industrial, or natural resource development (i.e., displacement of homes, businesses, or direct impacts on mineral extraction and timber harvest operations)
Moderate	• Areas where the Project would create a direct (short-term) or indirect (short- or long-term) conflict with existing land uses, such as residential, commercial, industrial, or natural resource development (i.e., displacement of homes, businesses, or direct impacts on mineral extraction and timber harvest operations)
Low	• Areas where land use is compatible with a transmission line such as industrial areas, linear features or existing or proposed utilities, vacant/undeveloped land, etc. • Areas where the project is in a designated (federal or local) utility corridor

The methodology for assessing the potential impacts on land uses associated with implementing the B2H Project generally includes:

- Identifying the types of potential effects that could result from construction, operation, and maintenance of the proposed transmission line and associated facilities
- Classifying the relative level of impacts on land uses to potential environmental effects
- Developing criteria for assessing the level of a potential effect on land uses
- Assessing the initial impacts on the land use
- Identifying the appropriate selective mitigation measures for minimizing potential adverse effects
- Determining specific areas where selective mitigation should be applied
- Disclosing potential residual impacts on land uses

Land Ownership, Utility Corridors, and Parallel Facilities

There are no criteria for assessing level of impacts on land ownership, utility corridors, or parallel facilities. In the results sections the miles crossed of each of these is disclosed.

Existing Land Use

Impact levels high, moderate and low were established to determine the level of impact the B2H Project would have on existing land uses. Significant impacts related to existing land use would be the result of high impacts that cannot be effectively mitigated.

Zoning

The impact analysis for zoning is different than other resources because the high, moderate, and low criteria were not used to quantitatively assess level of impacts as was done for most other resources. Instead the number of miles the B2H Project alternative routes cross a generalized zone is presented, followed by a qualitative discussion of the compatibility of the B2H Project with the future desired conditions identified in the comprehensive plan and potential conformance to local zoning codes. Each zone is designated and managed for a specific use, making impacts varied for each crossing. Significant impacts related to Zoning would be in areas where the B2H Project would physically conflict with any officially adopted policies or goals of the affected land-managing agency, and could not receive an amendment, variance or conditional-use permit for compliance.

Timber Management

The impact analysis for timber management is different than most other resources because the high, moderate, and low criteria were not used to quantitatively assess level of impacts as was done for most other resources. Instead, the number of miles in forested vegetation types crossed by each of the B2H Project alternative routes is presented, followed by a qualitative discussion of how this crossing may affect the resource. Potential impacts on timber management on BLM and private lands also are discussed qualitatively.

Fire Management

The impact analysis for fire management is different than most other resources because the high, moderate, and low criteria were not used to assess level of impacts as was done for most other resources. Because fire ignitions are unpredictable, and fire risk varies substantially with conditions at the time of ignition, a quantitative and site-specific discussion of potential impacts on fire management is not feasible. Differences in factors related to fire behavior, such as fire history and vegetation condition, are discussed for each of the B2H Project alternative routes as a part of the existing environment. Similarly, the effectiveness of mitigation cannot be feasibly considered as it relates to fire management, and an analysis of initial and residual impacts is not presented.

Military Training

The impact analysis for military training is different than other resources because the high, moderate, and low criteria were not used to assess levels of impact quantitatively as was done for most other resources. Instead, the number of miles the B2H Project alternative routes cross a certain military training use in NWSTF Boardman Special-use Airspace and other military special-use airspace is presented, followed by a qualitative discussion (using the criteria for assessing the level of impacts) of how this crossing may affect the management prescriptions that would result in the military's ability to manage these areas. The B2H Project description includes structure-design modifications to meet the requirements of the Navy and the FAA in response to NWSTF Boardman's request to limit transmission line structure heights to 100 feet or less, and to allow NWSTF Boardman to meet their training mission.

Specially Designated Areas

The impact analysis for specially designated areas is different than other resources because the high, moderate, and low criteria were not used to assess level of impacts quantitatively as was done for most other resources. Instead, the number of how many miles the B2H Project alternative routes cross a specially designated area is presented, followed by a qualitative discussion (using the high, moderate, and low criteria) of how this crossing may affect the management prescriptions and the relevant/important values or special characteristics that would result in an agency's ability to manage these specially designated areas. Each specially designated area is designated and managed for a specific resource, making impacts varied for each crossing. Refer to Sections 3.2.2, 3.2.4, and Map 3-1 for further detail regarding the Ladd Marsh Wildlife Area.

For specific information regarding the impacts on resources in a specially designated area crossed by an alternative route, refer to the applicable resource section (e.g., biological resources, cultural resources).

Effects Analysis

Assessment of Initial Impacts

To determine initial impacts that could result from implementation of the B2H Project, the level of a potential effect on a land use was assessed. The level was determined based on the compatibility of the land use with construction of a new transmission line. The initial impacts were assigned using the criteria presented in the Criteria for Assessing Level of Impacts section above.

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection (Table 2-7), selective mitigation measures (Table 2-13) also would be used to minimize adverse impacts on land uses.

There are no selective mitigation measures identified for land ownership, zoning; timber management; fire management; or specially designated areas because the decision for permitting in these areas is the responsibility and determination of each jurisdiction crossed by the alternative route.

Residual Impacts

Table 3-223 summarizes the initial impacts on existing land uses, the selective mitigation measures listed in Table 2-13 applied to mitigate potentially adverse effects on those resources, and the remaining residual impacts. Section 3.2.6.4 reports on the high or moderate residual impacts mileages that would occur after selective mitigation is applied. Selective Mitigation Measures 5, 7, and 8 (minimizing vegetation clearing for operational maintenance, structure-design modification, and spanning or avoiding sensitive features) could be effective to mitigate initial impacts on existing land uses. Table 3-223 reports the initial and residual impacts that will occur after considering the application of design features the Applicant has committed to as standard practice during construction, operation, and/or maintenance as applicable (Table 2-7). For example, it would be standard practice for the Applicant to repair fences, gates, and walls damaged during construction to the original condition as required by the landowner or land-managing agency (Design Feature 22, Table 2-7).

Table 3-223. Summary of Initial and Residual Impacts on Land-Use Resources			
Resource	**Initial Impacts**	**Selective Mitigation Measures Applied**	**Residual Impacts**
Structures			
Building (Non-residence)	High	8	Low
Campground	High	8	Moderate
Extraction-Mining	Moderate	8	Low
Other	High/Moderate	8	Moderate/low
Rest stop	High	8	Moderate
Residential	High	8	Moderate/Low
Cemetery	High	8	Low
School/Educational Facility	High	8	Moderate
Outstructures	High	8	Low
Communication Facility	High	7, 8	Low
Wind Mill	High	7, 8	Low
Flood Control Facility	High	7, 8	Low
Power substations (include TetraTech and other substations layers)	Low	7, 8	Low
Utilities			
Transmission Lines	Moderate	8	Low
Pipelines	Moderate	8	Low
Existing Land Uses (reGAP) GAP Land Cover			
Agriculture	High	8	Moderate
Brea Ground, Cliff Talus	Low	Not applicable	Low
Developed/Disturbed	High	8	High/Moderate
Forest/Woodland	High	5, 8	Moderate
Grassland	Low	Not applicable	Low
Not classified	Low	Not applicable	Low
Shrubland	Moderate	Not applicable	Low

As noted above, there are no initial or residual impacts or selective mitigation measures identified for land ownership, utility corridors, and parallel facilities; zoning; timber management; fire management; or specially designated areas because the decision for permitting in these areas is the responsibility and determination of each jurisdiction crossed by the alternative route.

Additional Analysis

Additional analysis for the land-use sections includes acreage report of land uses within the 1-mile-wide study corridor, counts of structures, and other analysis to support the impact discussion.

3.2.6.5 AFFECTED ENVIRONMENT

This section describes the affected environment of the alternatives in terms of land ownership, utility corridors, and parallel facilities; existing land use; timber management; fire management; zoning; military training in NWSTF Boardman Special-use Airspace and other military special-use airspace; and specially designated areas within the 1-mile-wide study corridor. Although the following inventory lists many resources in the 1-mile-wide study corridor, only those resources potentially crossed or paralleled by the B2H Project centerline or right-of-way are discussed and analyzed in the Environmental Consequences results section.

SEGMENT 1—MORROW-UMATILLA

Land Ownership, Utility Corridors, and Parallel Facilities

The study corridors in Segment 1 cross portions of three counties in Oregon and include a variety of ownership and management entities, including federal, state, and local land-managing agencies. In addition, there are four incorporated cities, as well as numerous unincorporated communities, in the study corridors. Table 3-224 presents the acreage of land ownership crossed by alternatives and route variations in Segment 1 (MV-12).

Table 3-224. Land Ownership in the Study Corridor for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Land Ownership (acres)						
		Bureau of Land Management	Bureau of Reclamation	Tribal	Department of Defense	U.S. Forest	State	Private
Applicant's Proposed Action	91.9	42	1	70	3,757	2,793	614	51,526
Variation S1-B1	*6.4*	*42*	*0*	*0*	*0*	*2,793*	*7*	*1,745*
Variation S1-B2	*6.4*	*71*	*0*	*0*	*0*	*2,782*	*31*	*1,713*
East of Bombing Range Road	92.3	42	1	70	3,664	2,793	682	51,738
Applicant's Proposed Action – Southern Route	99.1	107	1	43	3,757	2,793	614	56,156
West of Bombing Range Road – Southern Route	95.6	125	1	43	3,757	2,793	614	54,238
Longhorn	88.2	134	0	70	–	2,793	7	53,420
Interstate 84	84.7	134	0	70	507	2,793	7	50,808
Variation S1-A1	*18.5*	*0*	*0*	*0*	*0*	*0*	*0*	*12,315*
Variation S1-A2	*18.5*	*0*	*0*	*0*	*0*	*0*	*0*	*12,349*
Interstate 84 – Southern Route	93.4	198	0	43	507	2,793	7	56,336

There is one type of designated utility corridor in the study corridors for Segment 1: a federal agency corridor designated in a land-use plan (refer to MV-12). With the exception of Interstate 84, Variations

S1-A1 and S1-A2, all other alternatives and route variations in Segment 1 are located in a utility corridor designated in the Wallowa-Whitman National Forest.

Existing linear energy-related facilities in the study corridors include transmission lines and pipelines. Table 3-225 provides a description of the major transmission line rights-of-way (69-kV and greater) in Segment 1. As noted, pipelines also are considered an existing linear facility, and are included in the analysis of linear facilities. However, the available data for this analysis are not refined enough to report by name, diameter, and owner. Refer to MV-12.

Table 3-225. Parallel Facilities in Segment 1—Morrow-Umatilla

Alternative Route	Length (miles)	Transmission Lines		
		Name	Voltage (kilovolts)	Owner
Applicant's Proposed Action	91.9	Boardman to Tap	69	Federal
		McNary to Boardman	230	Federal
		McNary to Santiam	230	Federal
		Roundup To La Grande	230	Federal
		McNary to Slatt	500	Federal
		Pilot Rock to Unknown	69	IOU
		Roundup To Pilot Rock	69	IOU
		Unknown	69	UECA
Variation S1-B1	*6.4*	*Roundup To La Grande*	*230*	*Federal*
Variation S1-B2	*6.4*	*Roundup To La Grande*	*230*	*Federal*
East of Bombing Range Road	92.3	Boardman to Tap	69	Federal
		McNary to Boardman	230	Federal
		McNary to Santiam	230	Federal
		Roundup To La Grande	230	Federal
		McNary to Slatt	500	Federal
		Pilot Rock to Unknown	69	IOU
		Roundup To Pilot Rock	69	IOU
		Unknown	69	UECA
Applicant's Proposed Action – Southern Route	99.1	Boardman to Tap	69	Federal
		McNary to Boardman	230	Federal
		McNary to Santiam	230	Federal
		Roundup To La Grande	230	Federal
		McNary to Slatt	500	Federal
		Unknown	69	UECA
West of Bombing Range Road – Southern Route	95.6	Boardman to Tap	69	Federal
		McNary to Boardman	230	Federal
		McNary to Santiam	230	Federal
		Roundup To La Grande	230	Federal
		McNary to Slatt	500	Federal
		Unknown	69	COLBEC
		Unknown	69	UECA

Table 3-225. Parallel Facilities in Segment 1—Morrow-Umatilla				
Alternative Route	Length (miles)	Transmission Lines		
		Name	Voltage (kilovolts)	Owner
Longhorn	88.2	McNary to Boardman	230	Federal
		McNary to Santiam	230	Federal
		Roundup To La Grande	230	Federal
		McNary to Slatt	500	Federal
		Pilot Rock to Unknown	69	IOU
		Roundup To Pilot Rock	69	IOU
		Unknown	69	UECA
Interstate 84	84.7	McNary to Boardman	230	Federal
		McNary To Roundup	230	Federal
		McNary to Santiam	230	Federal
		Roundup To La Grande	230	Federal
		McNary to Slatt	500	Federal
		Hinkle to Tap	69	IOU
		Pilot Rock to Unknown	69	IOU
		Roundup To Pilot Rock	69	IOU
		Unknown	69	UECA
		Unknown	69	UECA
		Unknown	69	UECA
Variation S1-A1	18.5	*McNary To Roundup*	*230*	*Federal*
Variation S1-A2	18.5	*McNary To Roundup*	*230*	*Federal*
Interstate 84 – Southern Route	93.4	McNary to Boardman	230	Federal
		McNary To Roundup	230	Federal
		McNary to Santiam	230	Federal
		Roundup To La Grande	230	Federal
		McNary to Slatt	500	Federal
		Hinkle to Tap	69	IOU
		Unknown	69	UECA
		Unknown	69	UECA
		Unknown	69	UECA

Table Notes:
COLBEC = Columbia Basin Electric Cooperative
IOU = Investor Owner Utility
UECA = Umatilla Electric Cooperative Association

Applicant's Proposed Action Alternative

The land ownership within the study corridor for the Applicant's Proposed Action Alternative is predominately private and DoD (NWSTF Boardman).

The land ownership within the study corridor for Variations S1-B1 and S1-B2 are predominately private and USFS (Wallowa-Whitman National Forest).

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The additional action would occur on private, state, and federal (DoD) land. As described in Chapter 2, Section 2.5.2.1, this design option involves partial removal of the existing BPA 69-kV line to allow the existing right-of-way for the BPA 69-kV line along the west side of Bombing Range Road to be repurposed for use by the B2H Project. The affected environment for this design option is similar to the affected environment described for the Applicant's Proposed Action Alternative.

Design Option 2

The additional action would occur on private, state, and federal (DoD) land. As described in Chapter 2, Section 2.5.2.1, this design option involves full removal of the existing BPA 69-kV line to allow the existing right-of-way for the BPA 69-kV line along the west side of Bombing Range Road to be partially repurposed for use by the B2H Project by removing all portions of the existing 69-kV line off of the NWSTF Boardman and constructing a new dual circuit 230-kV line on the east side of Bombing Range Road. The affected environment for this design option is similar to the affected environment described for the Applicant's Proposed Action Alternative.

Design Option 3

The additional action would occur on private, state, and federal (DoD) land. As described in Chapter 2, Section 2.5.2.1, this design option involves a new double-circuit 230-kV line, new 230- to 69-kV stepdown substation, and removal of all of the existing BPA 69-kV line from the NWSTF Boardman. This option assumes the new 230-kV line has already been built to support wind development and includes the option to stepdown power from the 230-kV line to feed the existing 69-kV line south of the NWSTF Boardman, allowing the 69-kV line to be removed entirely clearing the right-of-way for use by the B2H Project. The affected environment for this design option is similar to the affected environment described for the Applicant's Proposed Action Alternative.

East of Bombing Range Road Alternative

The land ownership within the study corridor for East of Bombing Range Road Alternative is similar to the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The land ownership within the study corridor for Applicant's Proposed Action – Southern Route Alternative is similar to the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The affected environment is the same as that discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

Design Option 2

The affected environment is the same as that discussed for Design Option 2 under the Applicant's Proposed Action Alternative.

Design Option 3

The affected environment is the same as that discussed for Design Option 3 under the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The land ownership within the study corridor for West of Bombing Range Road – Southern Route Alternative is similar to the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The affected environment is the same as that discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

Design Option 2

The affected environment is the same as that discussed for Design Option 2 under the Applicant's Proposed Action Alternative.

Design Option 3

The affected environment is the same as that discussed for Design Option 3 under the Applicant's Proposed Action Alternative.

Longhorn Alternative

The land ownership within the study corridor for Longhorn Alternative is predominately private and USFS.

Interstate 84 Alternative

The land ownership within the study corridor for Interstate 84 Alternative is predominately private and USFS with a small portion on BLM and DoD lands (Umatilla Ordnance Depot).

Variation S1-A1

The land ownership within the study corridor for both Variation S1-A1 and Variation S1-A2 is solely private.

Interstate 84 – Southern Route Alternative

The land ownership within the study corridor for Interstate 84 – Southern Route Alternative is similar to the Interstate 84 Alternative but includes more private lands.

Existing Land Use

Segment 1 begins at the Longhorn Substation in Morrow County and ends west of La Grande in Union County on the Wallowa-Whitman National Forest. Seven alternative routes and two areas of local variations were identified in Segment 1.

Table 3-226 presents acreages of existing land uses within the 1-mile-wide study corridor for the alternative routes and route variations in Segment 1.

Table 3-226. Existing Land Use within the 1-Mile-Wide Study Corridor for Segment 1—Morrow-Umatilla							
Alternative Route	Total Acres	Existing Land Use (acres)					
		Agriculture	Bare Ground, Cliff, Talus	Developed/Disturbed	Forest/ Woodland	Grassland	Shrubland
Applicant's Proposed Action	58,732	24,823	4	704	10,886	7,293	15,021
Variation S1-B1	*4,587*	*0*	*0*	*152*	*4,191*	*136*	*107*
Variation S1-B2	*4,597*	*1*	*0*	*220*	*4,069*	*149*	*158*
East of Bombing Range Road	58,926	25,175	4	708	10,886	7,482	14,672
Applicant's Proposed Action – Southern Route	63,400	22,166	18	688	11,409	11,014	18,105
West of Bombing Range Road – Southern Route	61,501	15,868	18	560	11,419	14,730	18,906
Longhorn	56,360	24,974	4	659	10,886	7,652	12,185
Interstate 84	53,503	26,194	17	2,315	10,902	5,644	8,431
Variation S1-A1	*12,306*	*9,174*	*12*	*879*	*8*	*498*	*1,736*
Variation S1-A2	*12,327*	*3,863*	*2*	*153*	*13*	*1,404*	*6,892*
Interstate 84 to Southern Route	59,067	24,015	31	2,300	11,425	9,560	11,736
Table Notes: This data is based on U.S. Geological Service GAP data.							

Table 3-227 presents existing structures within the 1-mile-wide study corridor of alternative routes and route variations in Segment 1.

Table 3-227. Existing Land Use Structures Crossed By or Adjacent to Alternative Routes and Route Variations in Segment 1—Morrow-Umatilla					
Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	1 building (non-residence) 1 other 1 outstructure 1 power substation	5 outstructures 1 residential	2 buildings (non-residence) 1 other 12 outstructures 2 residential	3 buildings (non-residence) 3 communication facilities 4 other 64 outstructures 13 residential 1 windmill	31 buildings (non-residence) 7 other 85 outstructures 26 residential 2 windmills
Variation S1-B1	*0*	*1 residential*	*0*	*1 communication facility* *4 outstructures* *2 residential*	*1 outstructure* *2 residential*

Table 3-227. Existing Land Use Structures Crossed By or Adjacent to Alternative Routes and Route Variations in Segment 1—Morrow-Umatilla

Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Variation S1-B2	*0*	*0*	*1 outstructure*	*0*	*1 outstructure* *6 residential*
East of Bombing Range Road	1 building (non-residence) 1 other 1 outstructure 1 power substation	1 other 5 outstructures 1 residential	2 buildings (non-residence) 12 outstructures 2 residential	3 buildings (non-residence) 3 communication facilities 6 other 64 outstructures 13 residential 1 windmill	30 building (non-residence) 5 other 85 outstructures 26 residential 2 windmills
Applicant's Proposed Action to Southern Route	1 building (non-residence) 1 other 1 outstructure 1 power substation	5 outstructures 1 residential	1 building (non-residence) 1 other 15 outstructures 1 residential	3 buildings (non-residence) 3 communication facilities 4 other 43 outstructures 9 residential 1 windmill	24 buildings (non-residence) 7 other 82 outstructures 24 residential 2 windmills
West of Bombing Range Road to Southern Route	1 building (non-residence) 1 other 1 power substation	5 outstructures 1 residential	1 other 14 outstructures 1 residential	2 buildings (non-residence) 3 communication facilities 4 other 35 outstructures 6 residential	38 buildings (non-residence) 6 other 82 outstructures 36 residential
Longhorn	1 building (non-residence) 9 outstructures	1 building (non-residence) 2 other 5 outstructures 2 residential	10 buildings (non-residence) 18 outstructures 2 residential	6 buildings (non-residence) 3 communication facilities 7 other 60 outstructures 12 residential 1 windmill	19 buildings (non-residence) 9 other 111 outstructures 1 power substation 24 residential 2 windmills
I-84	8 buildings (Non-residence) 1 communication facility 15 outstructures 1 rest stop	5 buildings (non-residence) 17 outstructures 2 residential	44 buildings (non-residence) 1 campground 1 extraction-mining 1 other 59 outstructures 29 residential	38 buildings (non-residence) 5 communication facilities 6 other 98 outstructures 35 residential 1 rest stop	67 buildings (non-residence) 4 other 228 outstructures 1 power substation 72 residential

Table 3-227. Existing Land Use Structures Crossed By or Adjacent to Alternative Routes and Route Variations in Segment 1—Morrow-Umatilla					
Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Variation S1-A1	*5 buildings (non-residence)* *1 communication facility* *1 outstructure*	*1 building (non-residence)* *2 outstructures*	*9 buildings (non-residence)* *14 outstructures* *3 residential*	*8 buildings (non-residence)* *2 communication facilities* *3 other* *8 outstructures* *5 residential*	*9 buildings (non-residence)* *1 other* *32 oustructures* *12 residential*
Variation S1-A2	*1 building (non-residence)* *9 outstructures*	*1 outstructure* *2 residential*	*2 buildings (non-residence)* *9 outstructures* *2 residential*	*23 oustructures* *3 residential*	*13 buildings (non-residence)* *1 communication facility* *1 other* *59 outstructures* *15 residential*
I-84 to Southern Route	8 buildings (non-residence) 1 communication facility 15 outstructures 1 rest stop	5 buildings (non-residence) 17 outstructures 2 residential	43 buildings (non-residence) 1 campground 1 extraction-mining 1 other 62 outstructures 28 residential	38 buildings (non-residence) 5 communication facilities 6 other 77 outstructures 31 residential 1 rest stop	61 buildings (non-residence) 4 other 225 outstructures 1 power substation 70 residential

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative in Segment 1 traverses Morrow, Umatilla and Union counties in Oregon, and can generally be characterized as rural residential, agricultural, NWSTF Boardman Special-use Airspace and other military special-use airspace and vacant undeveloped areas. The 1-mile-wide study corridor for this alternative crosses approximately 24,823 acres (or 42 percent) of lands associated with agricultural production and approximately 704 acres (or 1 percent) of developed lands (Table 3-226). The remaining 33,200 acres (or 57 percent) in this study corridor are undeveloped forest, grass and shrublands. Approximately 266 structures occur within 0.5 mile of the reference centerline of this alternative, and 4 structures are crossed by the reference centerline. An additional 6 structures are located within the proposed right-of-way, including one residence (Table 3-227).

In Morrow County, the Applicant's Proposed Action Alternative in Segment 1 exits the proposed Longhorn Substation to the south, crossing the intersection of Interstate 84 and U.S. Highway 730, where the transmission line would then cross to the west side of Bombing Range Road. The alternative continues along the west side of Bombing Range Road for approximately 12 miles, within a 90-foot-wide use area, currently occupied by a 69-kV transmission line owned by BPA, on the NWSTF Boardman. NWSTF Boardman is managed under a Memorandum of Agreement, which is subject to a

series of avigation easements that place restrictions on the use of land within the easement. The areas of restricted airspace in the vicinity of NWSTF Boardman are shown in Map 3-2. The line then crosses Bombing Range Road and turns to the east, traversing areas of irrigated and dryland agriculture for approximately 9 miles before entering Umatilla County. There are two wind turbine energy generation developments that have recently been constructed in Morrow County near Link 1-41.

In Morrow County, the Applicant's Proposed Action Alternative crosses residential areas categorized as widely dispersed and low density. Diluted concentrations of residences are present where the Applicant's Proposed Action Alternative crosses major roads such as I-84 and State Highway 287 and the Butler Creek area. The Applicant's Proposed Action Alternative is colocated with commercial/ industrial uses associated with railroad transfer yards and other energy transmission facilities including substations and other transmission lines.

In Umatilla County, the Applicant's Proposed Action Alternative crosses widely dispersed and low-density rural residential areas. The community of Pilot Rock is approximately 2.5 miles south of where the Applicant's Proposed Action Alternative crosses U.S. Highway 395.

The Applicant's Proposed Action Alternative would enter Union County approximately 0.5 mile southwest of the town of Kamela. The community of Kamela is approximately 0.3 mile north of where the Applicant's Proposed Action Alternative crosses into Union County. The unincorporated community of Kamela served as railroad station of the Union Pacific Rail Road to serve the wood and timber industry in the area. Kamela is composed of a low-density concentration of residences and limited commercial/industrial activity.

Variation S1-B1

Variation S1-B1 starts south of Kamela and crosses approximately 4,191 acres of forest/woodland. A small cluster of residences are located in the study corridor for this variation about 2.5 miles south of Kamela.

Variation S1-B2

Variation S1-B2 starts south of Kamela to parallel the existing 230-kV transmission line crossing Interstate 84 twice before rejoining the Applicant's Proposed Action Alternative south of the interstate. Existing land uses are similar to Variation S1-B1.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative traverses Morrow, Umatilla and Union counties in Oregon, and can generally be characterized as rural residential, agricultural, NWSTF Boardman Special-use Airspace and other military special-use airspace and vacant undeveloped areas. The study corridor for this alternative crosses approximately 25,175 acres (or 43 percent) of lands associated with

agricultural production and approximately 708 acres (or 1 percent) of developed lands (Table 3-226). The remaining 33,024 acres (or 56 percent) in the study corridor are undeveloped forest, grass and shrublands.

The East of Bombing Range Road Alternative is similar to the Applicant's Proposed Action Alternative. It differs only in that it parallels Bombing Range Road on the east side rather than on the west side of the road. This alternative is 0.4 mile longer than the Applicant's Proposed Action Alternative, and existing land uses within the 1-mile-wide study corridor are similar. As described in Section 2.5.2.1, the alternative route parallels the existing UEC 115-kV transmission line (located on the east side of Bombing Range Road) the BPA 69-kV line (located on the west side of Bombing Range Road). The remaining portions of this route are the same as the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative traverses Morrow, Umatilla and Union counties in Oregon, and can generally be characterized as rural residential, agricultural, NWSTF Boardman Special-use Airspace and other military special-use airspace and vacant undeveloped areas. The study corridor for this alternative crosses approximately 22,166 acres (or 35 percent) of lands associated with agricultural production and approximately 688 acres (or 1 percent) of developed lands (Table 3-226). The remaining 40,546 acres (or 64 percent) in the study corridor are undeveloped forest, grass and shrublands.

The Applicant's Proposed Action – Southern Route Alternative is the longest of the Segment 1 alternatives, and is the same as the Applicant's Proposed Action Alternative through Morrow County. In Umatilla County at Link 1-60 this alternative turns south crossing U.S. Highway 395 about 4 miles west of Pilot Rock and continue to the south before turning toward the east and ascending the Blue Mountains across Rocky Ridge, where it would continue the same alignment as the Applicant's Proposed Action Alternative (described above) from Link 1-65. Existing land uses are the same as those described for the Applicant's Proposed Action Alternative (Variation S1-B1), except that this alternative avoids the existing residences in the vicinity north of Pilot Rock. However, the route crosses in the vicinity of rural residences along Link 1-66 where it crosses Birch Creek.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

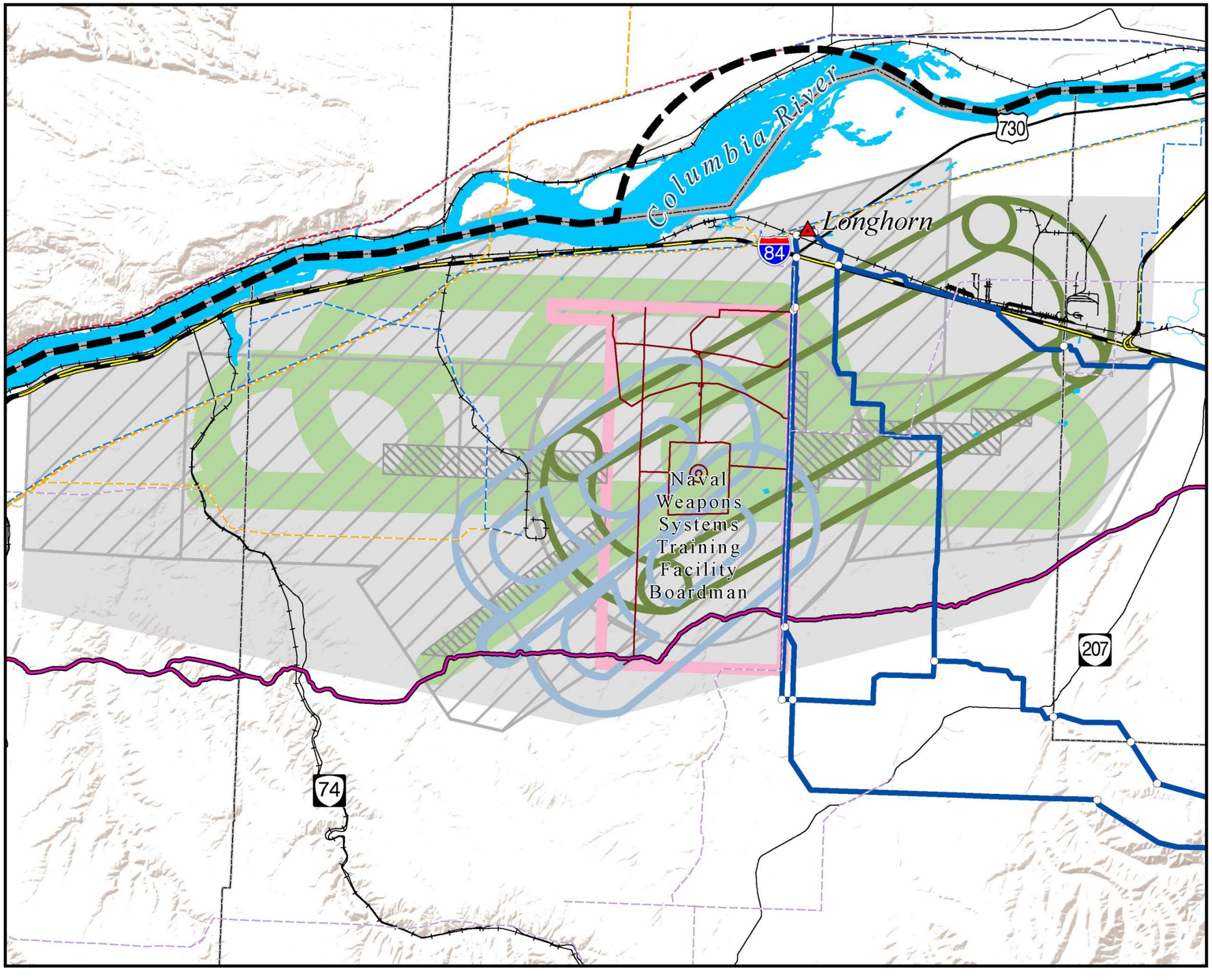
The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

Design Option 2

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

Design Option 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.



Map 3-2

Naval Weapons Systems Training Facility Boardman (NWSTF Boardman)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

NWSTF Boardman[1]

- NWSTF Boardman
- Firebreaks
- Flight Corridors (Proposed)
- Flight Corridor (Starting Point)
- Flight Corridor (Low Altitude Tactical Training)
- Military Avigation
- Restricted Special Use Airspace
- General Special Use Airspace

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Alternative Route
- Link Node

General Reference

- 500-kV Transmission Line
- 230-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
NWSTF Boardman, BLM 2015;
Firebreaks, U.S. Navy 2011; Military Flight Corridor Areas, U.S. Navy 2014;
Military Avigation Areas, U.S. Navy 2014 Special Use Airspace Zones, U.S. Navy 2010;
Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015;
Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
[1]The flight corridor data discussed in this B2H Project Environmental Impact Statement are pulled from the NWSTF Boardman Final Environmental Impact Statement (December 2015). New flight corridor data were not collected as part of the B2H Project.

- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 1 2
Miles
1:215,000 or 1 inch = 3 miles

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West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative traverses Morrow, Umatilla and Union counties in Oregon, and can generally be characterized as rural residential, agricultural, NWSTF Boardman Special-use Airspace and other military special-use airspace and vacant undeveloped areas. The study corridor for this alternative crosses approximately 15,868 acres (or 26 percent) of lands associated with agricultural production and approximately 560 acres (or 1 percent) of developed lands (Table 3-226). The remaining 45,073 acres (or 73 percent) in the study corridor are undeveloped forest, grass and shrublands.

The existing land uses within the study corridor are the same as the Applicant's Proposed Action – Southern Route Alternative for Links 1-1 through 1-41 and Links 1-66 through 1-77. At Link 1-41, the West of Bombing Range Road – Southern Route Alternative diverges from the Applicant's Proposed Action – Southern Route Alternative and continues an additional 5 miles to the south avoiding wind farm developments in Morrow County. Just west of Oregon Route 207, the alternative would turn to the east traversing an area of dryland agriculture for 15 miles before crossing Butter Creek and turning to the southeast paralleling Matlock Canyon. This alternative route then continues to the east for approximately 25 miles crossing U.S. Highway 395 approximately 9 miles southwest of Pilot Rock. The study corridor for this alternative crosses approximately 6,298 fewer acres of agricultural lands than the Applicant's Proposed Action – Southern Route Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Longhorn Alternative traverses Morrow, Umatilla and Union counties in Oregon, and can generally be characterized as rural residential, agricultural, NWSTF Boardman Special-use Airspace and other military special-use airspace and vacant undeveloped areas. The study corridor for this alternative crosses approximately 24,974 acres (or 44 percent) of lands associated with agricultural production and approximately 659 acres (or 1 percent) of developed lands (Table 3-226). The remaining 30,727 acres (or 55 percent) in the study corridor are undeveloped forest, grass and shrublands.

The Longhorn Alternative exits the proposed Longhorn Substation to the east crossing U.S. Highway 730 before turning to the south across Interstate 84. This alternative route then continues to the southeast avoiding irrigated agricultural lands and the Boardman Tree Farm for approximately 8 miles, then the transmission line would turn to the south toward Sand Hollow before heading east at Link 1-45. From Link 1-45 and where the alternative crosses Umatilla and Union counties, the Longhorn Alternative is the same as the Applicant's Proposed Action Alternative (Variation S1-B1). The Longhorn Alternative differs from the Applicant's Proposed Action Alternative by avoiding the NWSTF Boardman; however, it crosses approximately 2.5 miles more agricultural lands.

Interstate 84 Alternative

The Interstate 84 Alternative is approximately 84.7 miles in long, and traverses Morrow, Umatilla and Union counties in Oregon, and can generally be characterized as rural residential, commercial/industrial, agricultural, military special-use airspace and vacant undeveloped areas. The study corridor for this alternative crosses approximately 26,194 acres (or 49 percent) lands associated with agricultural production and approximately 2,315 acres (or 4 percent) of developed lands (Table 3-226). The remaining 24,994 acres (or 47 percent) in the study corridor are undeveloped forest, grass and shrublands.

The Interstate 84 Alternative exits the planned Longhorn Substation to the east crossing U.S. Highway 730 and then parallels the north side of Interstate 84 for approximately 6.5 miles before crossing Interstate 84 adjacent to the Umatilla Ordnance Depot, and then paralleling the south side of Interstate 84 for approximately 29 miles to an area 6 miles west of Pendleton. In this area the alternative crosses areas of dense pivot and other irrigated farmlands as well as dryland farming. Clusters of low-density residential and commercial/industrial areas are located in the study corridor near the junction of I-84 and Hermiston Highway and the junction of I-84 and U.S. Highway 395, just south of the City of Stanfield. The alternative route then turns to the south crossing the Umatilla River before joining the alignment of the Applicant's Proposed Action Alternative northwest of Pilot Rock at Link 1-49. From Link 1-50 to 1-66 in Umatilla and Union counties, the affected environment would be the same as that described for the Applicant's Proposed Action Alternative.

Variation S1-A1

The affected environment for Variation S1-A1 would be the same as that described for the Interstate 84 Alternative along Link 131 crossing areas of dense pivot and other irrigated farmlands as well as dryland farming, with dispersed rural residences in the study corridor.

Variation S1-A2

This variation separates from the Interstate 84-Alternative by turning southeast in an area north of the community of Echo at Link 1-37 and parallels the existing 230-kV line crossing the Umatilla River approximately 15 miles west of Pendleton. The route continues to parallel the Umatilla River, about 1 mile to the south for another 9 miles before rejoining the Interstate 84 Alternative at Link 1-39. This variation crosses 726 fewer acres of developed land uses along the I-84 than Variation S1-A1. Low-density rural residential areas are located near the communities of Echo and Nolin in the study corridor.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative is approximately 93.4 miles in length (8.7 miles longer than the Interstate 84 Alternative), and traverses Morrow, Umatilla and Union counties in Oregon. This alternative can generally be characterized as rural residential, commercial/Industrial, agricultural, military special-use airspace and vacant undeveloped areas. The study corridor for this alternative crosses approximately 24,015 acres (or 41 percent) lands associated with agricultural production and approximately 2,300 acres (or 4 percent) of developed lands (Table 3-226). The remaining 32,755 acres (or 55 percent) in the study corridor are undeveloped forest, grass and shrublands.

The Interstate 84 – Southern Route Alternative is the same as the Interstate 84 Alternative as it exits the proposed Longhorn Substation to the east crossing U.S. Highway 730 and then parallels the north side of Interstate 84 for approximately 6.5 miles. It then crosses Interstate 84 adjacent to the Umatilla Ordnance Depot, weaves through some agriculture, and parallels the south side of Interstate 84 for approximately 29 miles to an area 6 miles west of Pendleton. The alternative route then turns to the south crossing the Umatilla River and Jack Canyon before joining the Southern Route southwest of Pilot Rock and ascending the Blue Mountains across Rocky Ridge, where it shares the same alignment as the Applicant's Proposed Action Alternative from Link 1-65. Existing land uses are the same as those described for the Interstate 84 Alternative from Links 1-5 to 1-50, and the same as the Applicant's Proposed Action – Southern Route Alternative from Links 1-83 to 1-77.

The U.S. Army Umatilla Chemical Depot is located north of Interstate 84, approximately 12 miles northeast of NWSTF Boardman. This area was used for storage of chemical weapons until 2011. In 2010 the Redevelopment Plan for the site was adopted and the Columbia Development Authority is leading the effort for redevelopment of the site. The current redevelopment plan calls for the creation of a 7,500 acre National Guard training facility, 5,700 acre multi-use refuge, and approximately 3,965 acres of industrial, agriculture, or right-of-way redevelopment acreage. The details of the land transfer from the U.S. Army are under negotiation and the redevelopment of this area has not begun.

Timber Management

Table 3-228 identifies the extent of forested areas crossed by the alternatives and route variations in Segment 1. The information in Table 3-228 is derived from the forested vegetation types identified in the vegetation resources inventory (refer to Section 3.2.3). RCAs are not included in Table 3-228 because it is assumed that RCAs do not provide a timber resource. Sufficient data are not available to determine whether forested lands currently are being managed for timber resources or could be in the future.

Table 3-228. Forested Areas in the Study Corridor for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Forested Vegetation Type (miles crossed)				
		Aspen	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Total
Applicant's Proposed Action	91.9	0.3	0.1	0.0	13.6	14.0
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*5.7*	*5.7*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*5.1*	*5.1*
East of Bombing Range Road	92.3	0.3	0.1	0.0	13.6	14.0
Applicant's Proposed Action – Southern Route	99.1	0.3	0.1	0.2	14.7	15.3
West of Bombing Range Road – Southern Route	95.6	0.3	0.1	0.2	14.7	15.3
Longhorn	88.2	0.3	0.1	0.0	13.6	14

Table 3-228. Forested Areas in the Study Corridor for Segment 1—Morrow-Umatilla						
Alternative Route	Total Length (miles)	Forested Vegetation Type (miles crossed)				
		Aspen	Forest- Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Total
Interstate 84	84.7	0.3	0.1	0.0	13.6	14
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.3	0.1	0.2	14.7	15.3

Applicant's Proposed Action Alternative

Timber resources crossed by the Applicant's Proposed Action Alternative are primarily located on private lands and the Wallowa-Whitman National Forest in southeastern Umatilla and northwestern Union counties. The portions of the Wallowa-Whitman National Forest crossed by the Applicant's Proposed Action Alternative are not identified as timber management areas.

Other Alternative Routes and Variations in Segment 1

The timber resources present are similar among all other alternative routes and variations in Segment 1, refer to Table 3-228.

Fire Management

This section presents information on recent fire history, using available data dating from 2000 through 2015. All other aspects of the affected environment for fire management are considered to be common to all alternatives. Refer to Section 3.2.3 for additional information on fire ecology.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative primarily crosses areas that have not been affected by recent fires (i.e., since 2000). The Boardman Fire burned 27,165 acres in 2015, including a portion of the NWSTF Boardman training facility up to Bombing Range Road. The Applicant's Proposed Action Alternative crosses a portion of the previously burned area in this location.

Variations S1-B1 and S1-B2

No recently burned areas are crossed by Variations S1-B1 and S1-B2.

Additional Action – 69-Kilovolt Line Replacement

The additional action and its design options cross a portion of the area burned by the Boardman Fire.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative shares much of the same alignment with the Applicant's Proposed Action Alternative. The Boardman Fire burned 27,165 acres in 2015, including a portion of the NWSTF Boardman training facility up to Bombing Range Road. The East of Bombing Range Road Alternative crosses or is adjacent to a portion of the previously burned area in this location.

Applicant's Proposed Action – Southern Route Alternative

The recently burned areas crossed by the Applicant's Proposed Action – Southern Route Alternative are the same as those described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The recently burned areas crossed by the West of Bombing Range Road – Southern Route Alternative are the same as those described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

No recently burned areas are crossed by the Longhorn Alternative.

Interstate 84 Alternative and Variations

No recently burned areas are crossed by the Interstate 84 Alternative.

Variations S1-A1 and S1-A2

No recently burned areas are crossed by Variations S1-A1 and S1-A2.

Interstate 84 – Southern Route Alternative

No recently burned areas are crossed by the Interstate 84 – Southern Route Alternative.

Zoning

The following is an inventory of the generalized zoning classifications for each alternative and route variation in Segment 1. Refer to Section 3.2.6.4 for a description of the generalized zoning types, and MV-14 for their locations.

Applicant's Proposed Action Alternative

Approximately 70 percent of the Applicant's Proposed Action Alternative crosses lands zoned for agriculture and approximately 17 percent zoned for Timber/Grazing. Other zones crossed include industrial zones, and federal zones associated with the NWSTF Boardman.

Variations S1-B1 and S1-B2

Approximately 100 percent of the Variations S1-B1 and S1-B2 cross lands zoned for Timber/Grazing.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Zoning for lands associated with the additional action Design Options 1 through 3 would be the same as described for the Applicant's Proposed Action Alternative.

East of Bombing Range Road Alternative

Approximately 81 percent of the East of Bombing Range Road Alternative crosses lands zoned for agriculture and approximately 17 percent zoned for Timber/Grazing and 2 percent zoned industrial zone.

Applicant's Proposed Action – Southern Route Alternative

Approximately 71 percent of the Applicant's Proposed Action – Southern Route Alternative crosses lands zoned for agriculture and approximately 17 percent zoned for Timber/Grazing. Other zones crossed include industrial zones, and federal zones associated with the NWSTF Boardman.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Zoning for lands associated with the additional action Design Options 1 through 3 would be the same as described for the Applicant's Proposed Action – Southern Route Alternative.

West of Bombing Range Road – Southern Route Alternative

Approximately 70 percent of the West of Bombing Range Road – Southern Route Alternative crosses lands zoned for agriculture and approximately 17 percent zoned for Timber/Grazing. Other zones crossed include industrial zones, and federal zones associated with the NWSTF Boardman.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Zoning for lands associated with the additional action Design Options 1 through 3 would be the same as described for the West of Bombing Range Road – Southern Route Alternative.

Longhorn Alternative

Approximately 81 percent of the Longhorn Alternative crosses lands zoned for agriculture and approximately 18 percent zoned for Timber/Grazing, and 1 percent zoned for industrial.

Interstate 84 Alternative and Variations

Approximately 77 percent of the Interstate 84 Alternative crosses lands zoned for agriculture and approximately 19 percent zoned for Timber/Grazing. Other zones crossed include commercial and industrial zones.

Variation S1-A1

Approximately 98 percent of the Variation S1-A1 crosses lands zoned for agriculture and approximately 2 percent zoned for Industrial.

Variation S1-A2

Approximately 100 percent of the Variation S1-A2 crosses lands zoned for agriculture.

Interstate 84 – Southern Route Alternative

Approximately 78 percent of the Interstate 84 – Southern Route Alternative crosses lands zoned for agriculture and approximately 18 percent zoned for Timber/Grazing. Other zones crossed include commercial and industrial zones.

Military Training

Table 3-229 presents the affected environment for special-use airspace and training routes in the study corridor for alternatives and route variations in Segment 1.

Table 3-229. Military Training Areas in the Study Corridor for Segment 1—Morrow-Umatilla		
Alternative Route	**Total Length (miles)**	**Military Training Areas (miles crossed)**
Applicant's Proposed Action	91.9	15.1
Variation S1-B1	*6.4*	*0.0*
Variation S1-B2	*6.4*	*0.0*
East of Bombing Range Road	92.3	15.2
Applicant's Proposed Action – Southern Route	99.1	15.1
West of Bombing Range Road – Southern Route	95.6	15.1
Longhorn	88.2	17.6
Interstate 84	84.7	14.7
Variation S1-A1	*18.5*	*0.0*
Variation S1-A2	*18.5*	*0.0*
Interstate 84 – Southern Route	93.4	14.7

Applicant's Proposed Action Alternative

NWSTF Boardman is located in the northern portion of the B2H Project area approximately 0.5 mile south of the City of Boardman in Morrow County, Oregon. NWSTF Boardman supports regional training operations for units based in the Pacific Northwest area, including aviation unit stations at Naval Air Station Whidbey Island, Washington and units of the Oregon National Guard (ORNG).

Navy and ORNG Environmental Management Systems provide a formal management framework to achieve environmental goals through repeatable and consistent control of its operations. Compliance with environmental regulations and associated DoD, Navy, and ORNG policies is accomplished through a variety of well-established programs and related plans, processes, and procedures.

Area available for military ground training is confined to approximately 47,000 acres within the boundaries of NWSTF Boardman and approximately 490 square miles of special-use airspace are available above NWSTF Boardman. In addition, the ORNG uses the NWST Boardman training facility. Several air-to-ground target areas currently exist within the boundaries of NWSTF Boardman as well as several administrative buildings. Outside the eastern boundary of the facility along Bombing Range Road is an easement for road and utility corridor (Navy 2015).

The Applicant's Proposed Action Alternative is located along the western right-of-way boundary of Bombing Range Road (on property owned by NWSTF Boardman) within a 90-foot-wide use area currently occupied by BPA's 69-kV transmission line. The repurposing of the 90-foot-wide use area would dissolve the current agreement and necessitate a new land-use agreement for the use of NWSTF Boardman property between the Applicant and the Navy.

The land immediately surrounding NWSTF Boardman is predominately agricultural production, but also includes a Boeing Company test facility, a commercial solid waste landfill, and a Portland General Electric electrical generation plant (Navy 2015). Windmill development farms have recently been constructed in the southeast portion of the special-use airspace and more are planned in the surrounding area (refer to the Existing Land Use section of Segment 1 above).

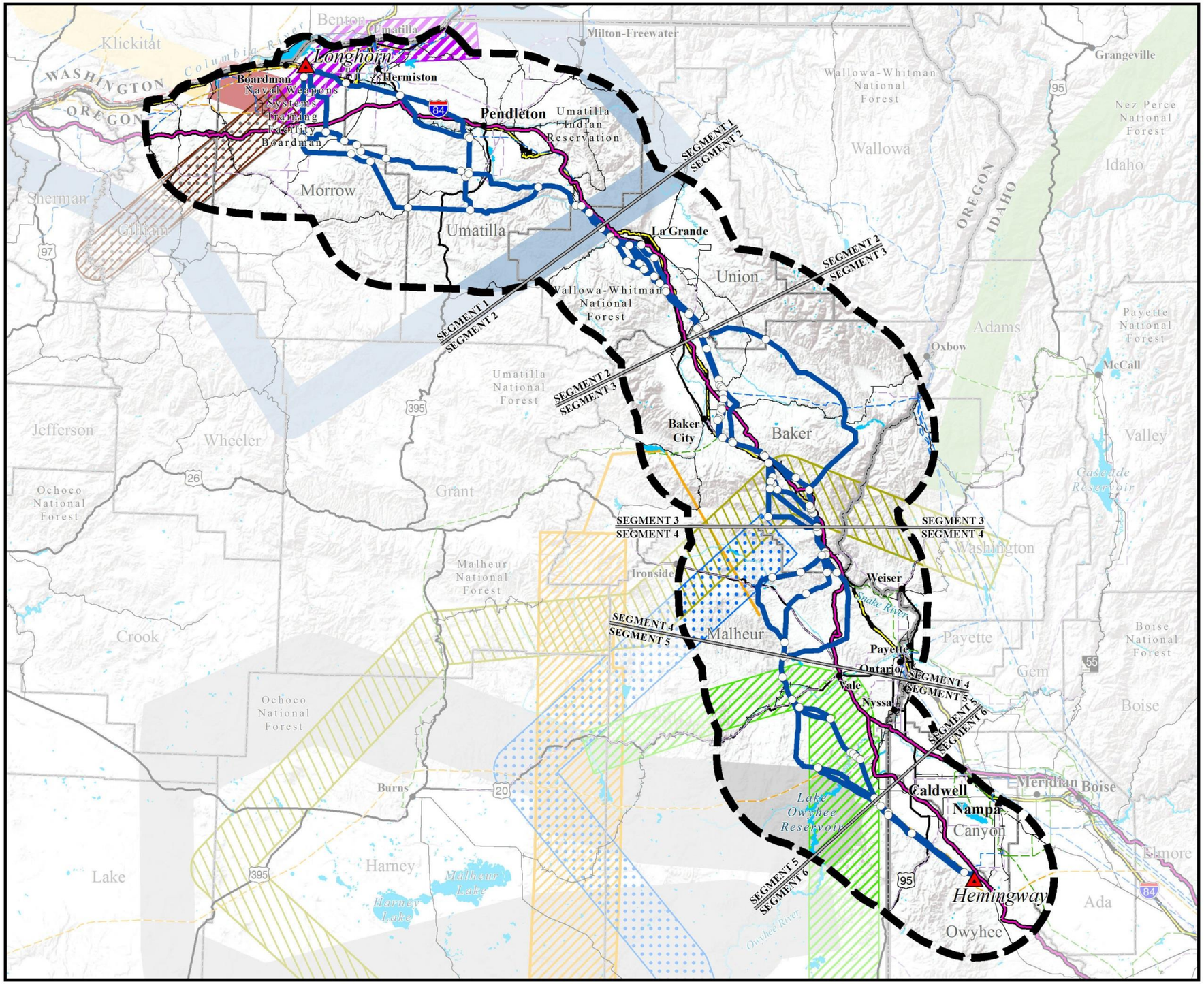
In April of 2016, NWSTF Boardman issued a ROD indicating that the Navy will move forward with Alternative 2 of their EIS. Alternative 2 of the NWSTF Boardman ROD will result in enhanced training and testing activities, including the construction of new range facilities. NWSTF Boardman will also expand new special-use airspace in the form of military operation areas (MOA) northeast of the NWSTF Boardman. Training activities for fixed wing and rotary wing aircrafts are planned to increase by 190 percent at NWSTF Boardman (Navy 2015).The additional MOA would include non-restricted airspace called Boardman Low MOA. This MOA consists of low altitude flight tracks (500 feet and above) within the northeast area of NWSTF Boardman Special-use Airspace.

Current training and testing activities conducted at NWSTF Boardman include the following:

- Air Warfare Training
- Electronic Warfare Training
- Strike Warfare (Air-to-Ground Exercises)
- Unmanned Aircraft System Operations Training and Testing
- Equipment and Personnel Insertion and Extraction Training
- Helicopter Training Operations
- Live Fire Range Operations
- Intelligence, Surveillance, and Reconnaissance Training (Navy 2015)

Military training routes (MTRs) are aerial corridors used solely by military aviation for training flights. The routes are the result of a joint venture between the FAA and the DoD to provide for high-speed, low-level military activities. Military training routes are divided in to instrument routes, and visual routes. Unless noted on the air navigation chart, aircraft may fly as low as 200 feet above ground level along these routes. Map 3-3 shows the location of MTRs in the B2H Project area.

The airspace over NWSTF Boardman comprises two different types of special-use airspace categories, including Restricted Areas and MOA airspace. Restricted Areas are established to confine or segregate activities that may be hazardous to aircrafts such as weapons firing, aerial gunnery, or unmanned aircraft system activities. This includes air warfare training for low altitude tactical training, surface to air counter tactics, and electronic warfare training. MOAs are designated to contain nonhazardous, military flight activates, including, but not limited to, air combat maneuvers, air intercepts, and low altitude tactics (Navy 2015). The MOA airspace overlies most of the restricted airspace areas. Approximately 15.1 miles of NWSTF Boardman Special-use Airspace (13.5 of which is restricted) falls within the study area for the Applicant's Proposed Action Alternative. Military training routes within special-use airspace associated with these activities extend beyond the footprint of the NWSTF Boardman training facility and extend throughout most of the study corridor in Segment 1 as shown in Map 3-3.



Map 3-3

Military Training Routes

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Military Training Routes

- Instrument Route (IR)-300
- IR-301/307
- IR-304
- IR-342/344/346
- IR-343
- Visual Route (VR)-1301
- VR-1302
- VR-1350/1351
- VR-1353
- VR-1354
- VR-1355
- VR-315/319

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Alternative Route
- Link Node
- Segment Line

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Military Training Routes, U.S. Navy 2009, 2012, Logan Simpson Design 2013;
Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10 20 30 40
Miles
1:1,393,920 or 1 inch = 22 miles

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These flight tracks travel over mostly agricultural lands and some residential development in the south portion of the City of Boardman. Refer to the Existing Land Use section above for further discussion of land use in Segment 1 of the B2H Project area.

The eastern portion of NWSTF Boardman is composed of an area used by The Nature Conservancy under a cooperative management agreement for approximately 5,050 acres. This area is divided into three tracts and managed as RNAs. The RNAs are part of a federal program and preserve high-quality areas of Columbia River Basin vegetation and associated wildlife. Refer to Specially Designated Areas of this section as well as Section 3.2.3, 3.2.4, and 3.2.13 for discussion regarding environmental resources present on NWSTF Boardman.

Prior training activities on NWSTF Boardman included activities such as weapons firing and air-to-ground bombing exercises. Therefore, NWSTF Boardman has safety concerns regarding the possible presence of unexploded ordnance resulting from historic military use of the property. NWSTF Boardman provides warning signage regarding unexploded ordinance hazards in areas where clearance has not been confirmed.

Fire safety is addressed through use of a system of 60-foot-wide fire breaks throughout NWSTF Boardman. These areas consist of small areas that are maintained by NWSTF Boardman to remain free of vegetation (or other combustible material) to provide a barrier to slow or stop the spread of fire. The B2H Project would use the existing fire break areas for staging of construction, operation and maintenance activities, in coordination with NWSTF Boardman, to minimize ground disturbance and avoid areas where unexploded ordinance clearance has not occurred. However, even areas that have previously been cleared of unexploded ordnance would require unexploded ordnance clearance protocols in coordination with NWSTF Boardman. Refer to MV-12 Land Status for locations of fire breaks in Segment 1 of the B2H Project area.

Variation S1-B1

The existing environment pertaining to military training would similar to the Applicant's Proposed Action Alternative. However, this variation does not cross any NWSTF Special-use Airspace.

Variation S1-B2

The existing environment pertaining to military training would be similar to the Applicant's Proposed Action Alternative. However, this variation does not cross any NWSTF Special-use Airspace.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

This additional action is relevant to the Applicant's Proposed Action Alternative. Design option 1 would involve partial removal of the existing BPA 69-kV line to allow the existing right-of-way for the BPA 69-kV line along the west side of Bombing Range Road to be repurposed for use by the B2H Project. Any new facilities would be located in private or state land. The existing environment pertaining to military training in special-use airspace would be the same as the Applicant's Proposed Action Alternative.

Design Option 2

This additional action is relevant to the Applicant's Proposed Action Alternative. Design option 2 would involve full removal of the existing 69-kV line to allow the existing right-of-way for the BPA 69-kV line along the west side of Bombing Range Road to be partially repurposed for use by the B2H Project by removing all portions of the existing 69-kV line off of the NWSTF Boardman and constructing a new dual circuit 230-kV line on the east side of Bombing Range Road. Any new facilities would be located in private or state land. The existing environment pertaining to military training in special-use airspace would be similar to the Applicant's Proposed Action Alternative.

Design Option 3

This additional action is relevant to the Applicant's Proposed Action Alternative. This design option would involve a new double-circuit 230-kV line, new 230 to 69-kV stepdown substation, and removal of all 69-kV line from the NWSTF Boardman. This option assumes the new 230-kV line has already been built to support wind development and includes the option to stepdown power from the 230-kV line to feed the existing 69-kV line south of the NWSTF Boardman, allowing the 69-kV line to be removed entirely clearing the right-of-way for use by the B2H Project. Any new facilities would be located in private or state land. The existing environment pertaining to military training in special-use airspace would be similar to the Applicant's Proposed Action Alternative.

East of Bombing Range Road Alternative

The existing environment pertaining to military training would be similar to the Applicant's Proposed Action Alternative. Approximately 15.2 miles of NWSTF Boardman Special-use Airspace (13.5 of which is restricted) falls within the study area for the East of Bombing Range Road Alternative. However, the proposed transmission line would be constructed along the east right-of-way boundary of Bombing Range Road.

Applicant's Proposed Action – Southern Route Alternative

The existing environment pertaining to military training and NWSTF Boardman Special-use Airspace would be the same as the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The existing environment pertaining to military training and NWSTF Boardman Special-use Airspace would be the same as the Applicant's Proposed Action Alternative.

Longhorn Alternative

The existing environment pertaining to military training would be similar to the Applicant's Proposed Action Alternative. Approximately 17.6 miles of NWSTF Boardman Special-use Airspace (14.9 of which is restricted) falls within the study area for the Longhorn Alternative. However, the Longhorn Alternative is located approximately 4 miles east of the NWSTF Boardman facility and would not necessitate a land-use agreement with the Navy for construction of transmission line structures or other B2H Project infrastructure.

Interstate 84 Alternative.

The existing environment pertaining to military training in special-use airspace would be similar to the Applicant's Proposed Action Alternative because the Interstate 84 Alternative is located within NWSTF Boardman Special-use Airspace. Approximately 14.7 miles of NWSTF Boardman Special-use Airspace (all of which is restricted) falls within the study area for the Interstate 84 Alternative. However, the Interstate 84 Alternative is colocated with Interstate 84 and would not necessitate a land-use agreement with the Navy for construction of transmission line structures or other B2H Project infrastructure.

Variation S1-A1

The existing environment pertaining to military training in would be similar to the Interstate 84 Alternative. However, Variation S1-A1 does not cross NWSTF Special-use Airspace.

Variation S1-A2

The existing environment pertaining to military training in would be similar to the Interstate 84 Alternative. However, Variation S1-A2 does not cross NWSTF Special-use Airspace.

Interstate 84 – Southern Route Alternative

The existing environment pertaining to military training and NWSTF Boardman Special-use Airspace would be the same as the Interstate 84 Alternative.

Specially Designated Areas

Specially designated areas are lands managed by federal or state agencies to protect values and land uses unique to an area. These areas typically require more intensive management emphasis than is applied to surrounding public lands. Specially designated areas are administratively designated. Administrative designations present in the study corridor are ACECs and RNAs. Other types of specially designated areas present in the B2H Project area include designations administered and managed by state natural resource and wildlife departments. These entities include missions to protect habitat, provide recreation and educational opportunities, such as Wildlife Areas. Table 3-230 presents the specially designated areas and their relevant and important values and management prescriptions for the alternatives and route variations in Segment 1.

Potential congressionally designated areas are described in Section 3.2.11; lands with wilderness characteristics are described in Section 3.2.10.

Table 3-230. Specially Designated Areas within the Study Corridor for Segment 1—Morrow-Umatilla		
Relevant and Important Values	**Management Prescriptions Relevant to Utility Rights-of-Way**	**Relevant Alternative Routes**
Areas of Critical Environmental Concern		
There are no ACECs present in the alternative route study corridors in Segment 1.		
Research Natural Areas		
Research Natural Area B		
196 acres in size; located outside of but immediately adjacent to the Target Octagon. It is included in a grazing lease; however, no grazing will occur on the area because it also is a dune stabilization area. It is fenced separately from the remaining lease area. Used for research on grazing/native plant relationships, noxious weed control studies, and other vegetation and wildlife studies. The Boardman Bombing Range contains the last high-quality representative of the native shrub-steppe vegetation that formerly covered millions of acres of the central Columbia Basin. The spectrum of sandy soils and sandy soil ecosystems is well represented and a number of species of concern are represented.	None. There is a developed set of standards and policy guidelines to provide greater uniformity in system definitions, objectives, classification, selection, use, management and administrative policies. The underlying emphasis in RNA management is on preserving and protecting the features of each area by controlling any disruptive use, encroachment, and development.	• Applicant's Proposed Action Alternative • Applicant's Proposed Action – Southern Route Alternative • East of Bombing Range Road Alternative • West of Bombing Range Road to Southern Route Alternative
Wildlife Areas		
Coyote Springs		
Part of the Columbia Basin Wildlife Area (Ladd Marsh Wildlife Area) and is located east of the City of Boardman in Morrow County along the Columbia River. The Coyote Springs Wildlife Area is within the Columbia Plateau ecoregion which is a composition of four ODFW managed wildlife areas. This wildlife area provides an important land base for the conservation and recreation of fish and wildlife within a highly privatized and altered landscape and plays an important role for the fall and spring migrations of waterfowl in addition to resident upland game bird production.	Signed into management agreement with the Bureau of Reclamation in 1975. Management of these areas will be habitat based, emphasizing management activities which provide for multiple species while maximizing hunting, fishing, trapping and other fish and wildlife-related recreational pursuits, where possible. The wildlife area contains an assortment of easements and access agreements. These agreements primarily pertain to irrigation delivery, power and natural gas transmission, rail and interstate transportation. All lands are owned by federal entities (i.e., Reclamation) and current easements and access agreements are held in trust.	• Applicant's Proposed Action Alternative • Applicant's Proposed Action – Southern Route Alternative • East of Bombing Range Road Alternative • West of Bombing Range Road to Southern Route Alternative

Area of Critical Environmental Concern

There are no ACECs present in the alternative route study corridors for Segment 1.

Research Natural Areas

According to the NWSTF Boardman Final INRMP, "RNAs are part of a federal government system established for research and educational purposes. Natural features are preserved for scientific purposes and natural processes are allowed to dominate. The RNA program was created to (1) preserve examples of all significant natural ecosystems for comparison with those influenced by man, (2) provide educational and research areas for ecological and environmental studies, and (3) preserve gene pools of typical and endangered plants and animals."

Three RNAs were established on the NWSTF Boardman in 1978 and are co-managed by The Nature Conservancy under a long-standing Cooperative Management Agreement with the Navy. Activities in the RNAs include "research and monitoring of the native habitat types and wildlife species, as well as control of noxious weeds."

Wildlife Areas

The Oregon Department of Fish and Wildlife manages state wildlife areas primarily to provide wildlife habitat, with recreational use as an incidental benefit in some locations. Public use for wildlife-oriented recreation is permitted in these areas, with some restrictions based on type of use, geographic extent, and/or season. Management plans are available for the Columbia Basin Wildlife Area (Ladd Marsh Wildlife Area). The management plans focus on habitat and wildlife management and do not address management for visual resources.

Applicant's Proposed Action Alternative

RNA – B on the NWSTF Boardman (Link 1-27) and Coyote Springs Wildlife Area is located in the study corridor for the Applicant's Proposed Action Alternative (refer to Table 3-230 for information related to relevant and important values and management prescriptions for these areas).

Variation S1-B1

This variation does not cross the RNA – B or Coyote Springs Wildlife Area.

Variation S1-B2

This variation does not cross the RNA – B or Coyote Springs Wildlife Area.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment would be the same as described for the Applicant's Proposed Action Alternative.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative's affected environment is the same as described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative's affected environment is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment would be the same as described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative's affected environment is the same as described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment would be the same as described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Longhorn Alternative avoids the RNA – B and the Coyote Springs Wildlife Area.

Interstate 84 Alternative and Variations

The Interstate 84 Alternative and Variations S1-A1 and S1-A2 avoid the RNA – B and the Coyote Springs Wildlife Area.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative avoids the RNA – B and the Coyote Springs Wildlife Area.

SEGMENT 2—BLUE MOUNTAINS

Land Ownership, Utility Corridors, and Parallel Facilities

The study corridors in Segment 2 cross portions of two counties in Oregon and include a variety of ownership and management entities, including federal, state, and local land-managing agencies. In addition, there is one incorporated city, as well as numerous unincorporated communities, in the study corridors. Table 3-231 presents the acreage of land ownership crossed for the alternatives and route variations in Segment 2 (MV-12).

Table 3-231. Land Ownership within the 1-Mile-Wide Study Corridor for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Land Ownership (acres)						
		Bureau of Land Management	Bureau of Reclamation	Tribal	Department of Defense	U.S. Forest	State	Private
Applicant's Proposed Action	33.8	180	0	0	0	1,593	43	20,133
Variation S2-A1	*2.8*	*0*	*0*	*0*	*0*	*1,480*	*41*	*814*
Variation S2-A2	*2.9*	*0*	*0*	*0*	*0*	*1,735*	*35*	*577*
Variation S2-B1	*3.7*	*164*	*0*	*0*	*0*	*0*	*0*	*2,670*
Variation S2-B2	*3.8*	*128*	*0*	*0*	*0*	*0*	*0*	*2,797*
Variation S2-C1	*9.3*	*0*	*0*	*0*	*0*	*40*	*0*	*6,393*
Variation S2-C2	*8.8*	*0*	*0*	*0*	*0*	*40*	*0*	*6,094*
Variation S2-E1	*2.3*	*0*	*0*	*0*	*0*	*21*	*0*	*1,922*
Variation S2-E2	*2.6*	*0*	*0*	*0*	*0*	*11*	*0*	*2,156*
Variation S2-F1	*12.1*	*16*	*0*	*0*	*0*	*0*	*0*	*8,198*
Variation S2-F2	*12.2*	*37*	*0*	*0*	*0*	*0*	*0*	*8,277*
Glass Hill	33.7	180	0	0	0	1,593	43	20,108
Variation S2-D1	*4.3*	*0*	*0*	*0*	*0*	*0*	*0*	*3,277*
Variation S2-D2	*4.1*	*0*	*0*	*0*	*0*	*25*	*0*	*3,110*
Mill Creek	34.0	114	0	0	0	1,735	62	20,324

There is one type of designated utility corridor in the study corridors for Segment 2, which is the USFS utility corridor located along Interstate-84 (refer to MV-12).

Existing linear energy-related facilities in the study corridors include transmission lines and pipelines. Table 3-232 provides a description of the major transmission line rights-of-way (69-kV and greater) relevant to the study corridors in Segment 2. As noted, pipelines also are considered an existing linear facility, and are included in the analysis of linear facilities. However the available data for this analysis are not refined enough to report by name, diameter, and owner. Refer to MV-12 for information regarding utility corridors within the B2H Project study corridor.

Table 3-232. Parallel Facilities within the 1-Mile-Wide Study Corridor for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Transmission Lines		
		Name	Voltage (kilovolts)	Owner
Applicant's Proposed Action	33.8	Unnamed	230	IPC
		Unnamed	115	Federal
		Roundup To La Grande 230-kV	230	Federal
Variation S2-A1	*2.8*	*Roundup To La Grande 230-kV*	*230*	*Federal*
Variation S2-A2	*2.9*	*Roundup To La Grande 230-kV*	*230*	*Federal*

Table 3-232. Parallel Facilities within the 1-Mile-Wide Study Corridor for Segment 2—Blue Mountains				
Alternative Route	**Total Length (miles)**	**Transmission Lines**		
		Name	**Voltage (kilovolts)**	**Owner**
Variation S2-B1	*3.7*	*Roundup To La Grande 230-kV*	*230*	*Federal*
Variation S2-B2	*3.8*	*Roundup To La Grande 230-kV*	*230*	*Federal*
Variation S2-C1	*9.3*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*8.8*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-E1	*2.3*	*Unnamed*	*230*	*IPC*
Variation S2-E2	*2.6*	*Unnamed*	*230*	*IPC*
Variation S2-F1	*12.1*	*Unnamed*	*230*	*IPC*
Variation S2-F2	*12.2*	*Unnamed* *Unnamed*	*230* *115*	*Federal* *IPC*
Glass Hill	33.7	Unnamed Unnamed Roundup To La Grande 230-kV	230 115 230	IPC Federal Federal
Variation S2-D1	*4.3*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-D2	*4.1*	*Not applicable*	*Not applicable*	*Not applicable*
Mill Creek	34.0	Unnamed Unnamed Roundup To La Grande 230-kV	230 115 230	IPC Federal Federal
Table Note: IPC = Idaho Power Company				

Applicant's Proposed Action Alternative

The land ownership within the study corridor for the Applicant's Proposed Action Alternative is predominately private and USFS (Wallowa-Whitman National Forest).

The land ownership within the study corridor for Variation S2-A1, S2-A2 is predominately USFS (Wallowa-Whitman National Forest) and private. The land ownership within the study corridor for Variation S2-B1 is predominately private and BLM.

The land ownership within the study corridor for the Glass Hill Alternative and Mill Creek Alternative is similar to the Applicant's Proposed Action Alternative (predominately private and USFS).

The land ownership within the study corridor for all other alternatives and route variations is predominately private.

Existing Land Use

Segment 2 begins west of La Grande in Union County on the Wallowa-Whitman National Forest and ends east of North Powder in Union County.

Table 3-233 presents acreages of existing land uses within the 1-mile-wide study corridor of the alternatives and route variations in Segment 2.

Table 3-233. Existing Land Use within the 1-Mile-Wide Study Corridor Segment 2—Blue Mountains

Alternative Route	Total Acres	Existing Land Use (acres)					
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland
Applicant's Proposed Action	21,920	626	188	245	9,846	1,004	10,011
Variation S2-A1	*2,333*	*4*	*5*	*141*	*1,503*	*384*	*296*
Variation S2-A2	*2,346*	*4*	*3*	*53*	*1,567*	*419*	*300*
Variation S2-B1	*2,834*	*36*	*42*	*10*	*1,591*	*45*	*1,110*
Variation S2-B2	*2,926*	*47*	*41*	*10*	*1,443*	*38*	*1,345*
Variation S2-C1	*6,432*	*11*	*39*	*0*	*4,955*	*60*	*1,368*
Variation S2-C2	*6,089*	*10*	*35*	*0*	*4,711*	*86*	*1,247*
Variation S2-E1	*1,943*	*0*	*5*	*0*	*1,093*	*15*	*831*
Variation S2-E2	*2,167*	*37*	*3*	*38*	*1,001*	*29*	*1,060*
Variation S2-F1	*8,187*	*499*	*105*	*90*	*555*	*472*	*6,466*
Variation S2-F2	*8,308*	*85*	*44*	*89*	*494*	*458*	*7,138*
Glass Hill	21,896	636	222	245	9,206	1,033	10,553
Variation S2-D1	*3,277*	*0*	*0*	*0*	*2,670*	*68*	*539*
Variation S2-D2	*3,135*	*0*	*0*	*0*	*2,585*	*249*	*300*
Mill Creek	22,228	595	175	315	7,386	1,476	12,281

Table Notes: This data is based on U.S. Geological Service GAP data.

Table 3-234 presents existing structures within the 1-mile-wide study corridor of alternatives and route variations in Segment 2.

Table 3-234. Existing Land Use Structures Crossed by or Adjacent to Alternatives and Route Variations in Segment 2—Blue Mountains

Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	1 outstructure	3 outstructures 1 residential	1 building (non-residence) 10 outstructures 1 power substation 1 residential	4 buildings (non-residence) 9 campground facilities 2 communication facilities 1 extraction-mining 9 outstructures 3 residential
Variation S2-A1	*0*	*0*	*0*	*1 outstructure*	*9 campground facilities* *1 extraction-mining* *1 outstructure*

Table 3-234. Existing Land Use Structures Crossed by or Adjacent to Alternatives and Route Variations in Segment 2—Blue Mountains					
Alternative Route	**Crossed by the Reference Centerline**	**Within the Right-of-way**	**Distance from Reference Centerline**		
			0.125-mile	**0.126 to 0.25-mile**	**0.26 to 0.5-mile**
Variation S2-A2	*0*	*0*	*0*	*1 outstructure*	*9 campground facilities* *1 outstructure*
Variation S2-B1	*0*	*0*	*0*	*0*	*0*
Variation S2-B2	*0*	*0*	*0*	*0*	*1 building (non-residence)* *2 outstructures* *1 residential*
Variation S2-C1	*0*	*0*	*0*	*1 outstructure*	*2 buildings (non-residence)* *5 outstructures* *3 residential*
Variation S2-C2	*0*	*0*	*1 outstructure*	*1 building (non-residence)* *3 outstructures* *1 residential*	*2 buildings (non-residential)* *6 outstructures* *5 residential*
Variation S2-E1	*0*	*0*	*0*	*0*	*2 communication facilities* *2 outstructures*
Variation S2-E2	*0*	*0*	*0*	*0*	*1 building (non-residence)* *2 communication facilities* *2 outstructures* *1 residential*
Variation S2-F1	*0*	*1 outstructure*	*3 outstructures* *1 residential*	*1 building (non-residence)* *8 outstructures* *1 power substation* *1 residential*	*2 communication facilities* *3 outstructures*
Variation S2-F2	*1 power substation*	*0*	*0*	*1 building (non-residence)* *1 outstructure*	*2 communication facilities* *14 outstructures* *2 residential*
Glass Hill	0	1 outstructure	3 outstructures 1 residential	1 building (non-residence) 9 outstructures 1 power substation 1 residential	4 buildings (non-residence) 9 campground facilities 2 communication facilities 1 extraction-mining 7 outstructures 2 residential

Table 3-234. Existing Land Use Structures Crossed by or Adjacent to Alternatives and Route Variations in Segment 2—Blue Mountains					
Alternative Route	**Crossed by the Reference Centerline**	**Within the Right-of-way**	**Distance from Reference Centerline**		
			0.125-mile	**0.126 to 0.25-mile**	**0.26 to 0.5-mile**
Variation S2-D1	*0*	*0*	*0*	*0*	*1 building (non-residence)* *1 outstructure* *2 residential*
Variation S2-D2	*0*	*0*	*0*	*0*	*1 building (non-residence)* *1 outstructure* *2 residential*
Mill Creek	1 power substation	0	0	6 buildings (non-residence) 9 campground facilities 18 outstructures 9 residential	10 buildings (non-residence) 2 communication facilities 1 other 35 outstructures 26 residential

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative in Segment 2 crosses unincorporated portions of Union and Baker counties in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed of forest, woodland, and shrublands, with agriculture and farming occurring near the southern end of the segment. The 1-mile-wide study corridor for this alternative crosses approximately 626 acres (or 3 percent) of lands associated with agricultural production and approximately 245 acres (or 1 percent) of developed lands (Table 3-233). The remaining 21,049 acres (or 96 percent) in this study corridor are undeveloped forest, grass and shrublands. Approximately 46 structures occur within 0.5 mile of the reference centerline of this alternative. No structures are crossed by the reference centerline, but one outstructure is located within the proposed right-of-way (Table 3-234).

Variation S2-A1

Variation S2-A1 is approximately 2.9 miles long, and is located approximately 2 miles west of the community of Hilgard along Links 2-1 and 2-5 of the Applicant's Proposed Action Alternative. The existing land use within the study corridor for this variation can generally be characterized vacant undeveloped areas composed of forest, woodland, and shrublands. Approximately 12 structures are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-A2

Variation S2-A2 is similar in length and existing land use characteristics to Variation S2-A1. Eleven structures are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-B1

Variation S2-B1 is approximately 3.6 miles long, and is located approximately 2.4 miles south of the community of Hilgard along Links 2-30 and 2-35 of the Applicant's Proposed Action Alternative. Existing land uses within the study corridor for this variation can generally be characterized vacant undeveloped areas composed of forest, woodland, and shrublands. No structures are located within 0.5 mile of the reference centerline of this variation.

Variation S2-B2

Variation S2-B2 is approximately 3.8 miles long, and is located approximately 2.5 miles south of the community of Hilgard along Link 2-25. Within the study corridor for this variation existing land use characteristics are similar to Variation S2-B1. Approximately four structures, including one residence, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-C1

Variation S2-C1 is approximately 9.3 miles long, and is located approximately 3.9 miles southwest of the city of La Grande along Links 2-45, 2-47, and 2-50 of the Applicant's Proposed Action Alternative. Existing land uses within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed of forest, woodland, and shrublands. Approximately 11 structures, including 3 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-C2

Variation S2-C2 is approximately 8.8 miles long, and is located approximately 3.2 miles southwest of the city of La Grande along Link 2-48. Existing land use characteristics within the study corridor for this variation are similar to Variation S2-C1. Approximately 19 structures, including 6 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-E1

Variation S2-E1 is approximately 2.3 miles long and is located approximately 7.7 miles west of the city of Union along Link 2-60 of the Applicant's Proposed Action Alternative. Existing land uses within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed of forest, woodland, and shrublands. Approximately four structures are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-E2

Variation S2-E2 is approximately 2.6 miles long and is located approximately 7.2 miles west of the city of Union along Links 2-55 and 2-65. In addition to being similar to Variation S2-E1 for existing land use characteristics, small areas of agriculture and developed land occur within the study corridor for Variation S2-E2. Approximately six structures, including one residence, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-F1

Variation S2-F1 is approximately 12.1 miles long and is located approximately 3.0 miles northeast of the city of North Powder along Links 2-75, 2-85, and 2-95 of the Applicant's Proposed Action Alternative. Existing land uses within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed of predominantly shrubland, with small areas of agriculture, developed land, forest and woodlands. Approximately 21 structures, including 20 residences, are located within 0.5 mile of the reference centerline of this variation, and one outstructure is located within the proposed right-of-way.

Variation S2-F2

Variation S2-F2 is approximately 12.2 miles long and is located approximately 3.4 miles northeast of the city of North Powder along Links 2-70, 2-80, and 2-90. The existing land uses occurring within the study corridor for this variation are similar to Variation S2-F1 except that less agricultural lands occur. Approximately 21 structures, including 2 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation one structure, an electric power substation, is crossed by the reference centerline.

Glass Hill Alternative

The Glass Hill Alternative in Segment 2 crosses unincorporated portions of Union and Baker counties in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed of forest, woodland, and shrublands, with agriculture and farming occurring near the southern end of the segment. The 1-mile-wide study corridor for this alternative crosses approximately 636 acres (or 3 percent) of lands associated with agricultural production and approximately 245 acres (or 1 percent) of developed lands (Table 3-233). The remaining 21,015 acres (or 96 percent) in this study corridor are undeveloped forest, grass and shrublands. Approximately 42 structures, including 4 residences, occur within 0.5 mile of the reference centerline of this alternative, and one structure is located within the proposed right-of-way. For this alternative no structures are crossed by the reference centerline (Table 3-234).

Variation S2-D1

Variation S2-D1 is approximately 4.1 miles long and is located approximately 5.2 miles southwest of the city of La Grande along Links 2-42, and 2-47 of the Glass Hill Alternative. Existing land uses within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed of predominantly forest woodland, shrubland, and grassland. Approximately four structures, including

two residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S2-D2

Variation S2-D2 is approximately 4.3 miles long and is located approximately 6.0 miles southwest of the city of La Grande along Link 2-46. Existing land use characteristics within the study corridor for this variation are similar to Variation S2-D1.

Mill Creek Alternative

The Mill Creek Alternative in Segment 2 crosses unincorporated portions of Union and Baker counties in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed of forest, woodland, and shrublands, with agriculture and farming occurring near the southern end of the segment. The 1-mile-wide study corridor for this alternative crosses approximately 595 acres (or 3 percent) of lands associated with agricultural production and approximately 315 acres (or 1 percent) of developed lands (Table 3-233). The remaining 21,317 acres (or 96 percent) in this study corridor are undeveloped forest, grass and shrublands. Approximately 117 structures, including 35 residences, occur within 0.5 mile of the reference centerline of this alternative, and one structure, an electric power substation is crossed by the reference centerline (Table 3-234).

Timber Management

Table 3-235 presents the affected environment for timber management for the alternatives and route variations in Segment 2.

Table 3-235. Timber Management within the 1-Mile-Wide Study Corridor for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Aspen	Forest-Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Total
Applicant's Proposed Action	33.8	0.2	0.0	1.1	10.1	11.4
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*1.4*	*1.4*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*1.5*	*1.5*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.1*	*1.2*	*1.3*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*1.4*	*1.4*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.9*	*5.0*	*5.9*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.7*	*4.7*	*5.4*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*1.2*	*1.2*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.4*	*0.8*	*1.2*
Variation S2-F1	*12.1*	*0.2*	*0.0*	*0.0*	*0.1*	*0.3*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.2*	*0.0*	*0.2*
Glass Hill	33.7	0.2	0.0	1.3	8.9	10.4
Variation S2-F1	*4.3*	*0.0*	*0.0*	*1.0*	*2.2*	*3.2*
Variation S2-F2	*4.1*	*0.0*	*0.0*	*0.0*	*2.4*	*2.4*
Mill Creek	34.0	0.0	0.0	1.3	7.3	8.6

Applicant's Proposed Action Alternative

Timber resources crossed by the Applicant's Proposed Action Alternative are primarily located on private lands and a small portion of the Wallowa-Whitman National Forest in northwestern and central Union County. The portions of the Wallowa-Whitman National Forest crossed by the Applicant's Proposed Action Alternative are not identified as timber management areas. However, a Power Transportation Facilities Management Area (Management Area 17) area is identified in this portion of the Wallowa-Whitman National Forest north of Interstate 84 just west of La Grande. This area is presently in use for transport of gas, oil and electricity (USFS 1990).

Other Alternative Routes and Variations in Segment 2

The timber resources, where present, are similar among all other alternative routes and variations in Segment 2 (Table 3-235).

Fire Management

No recent fires burned any areas crossed by alternative routes and variations on Segment 2. All other aspects of the affected environment for fire management are considered to be common to all alternatives. Refer to Section 3.2.3 for additional information on fire ecology.

Zoning

The following is an inventory of the generalized zoning classifications for each alternative and route variation in Segment 2. Refer to Section 3.2.6.4 for a description of the generalized zoning types, and MV-14 for their locations.

Applicant's Proposed Action Alternative

Approximately 70 percent of the Applicant's Proposed Action Alternative crosses lands zoned for Timber/Grazing, approximately 15 percent zoned for Grazing, and approximately 14 percent crosses lands zoned for Agriculture.

Variations S2-A1, S2-A2, S2-B1, S2-B2, S2-C1, and S2-C2

Approximately 100 percent of the variations cross lands zoned for Timber/Grazing.

Variation S2-E1

Approximately 61 percent of the Variation S2-E1 crosses lands zoned for Timber/Grazing, and approximately 39 percent zoned for Grazing.

Variation S2-E2

Approximately 46 percent of the Variation S2-E2 crosses lands zoned for Timber/Grazing, and approximately 54 percent zoned for Grazing.

Variation S2-F1

Approximately 40 percent of the Variation S2-F1 crosses lands zoned for Agriculture, approximately 34 percent zoned for Grazing. Other zones crossed include Timber/Grazing and Industrial.

Variation S2-F2

Approximately 39 percent of the Variation S2-F2 crosses lands zoned for zoned for Grazing, approximately 35 percent Timber/Grazing and approximately 25 percent crosses lands zoned for Agriculture.

Glass Hill Alternative

Approximately 70 percent of the Glass Hill Alternative crosses lands zoned for Timber/Grazing, approximately 15 percent zoned for Grazing, and approximately 14 percent crosses lands zoned for Agriculture.

Variations S2-D1 and S2-D2

Approximately 100 percent of Variations S2-D1 and S2-D2 cross lands zoned for Timber/Grazing.

Mill Creek Alternative

Approximately 73 percent of the Mill Creek Alternative crosses lands zoned for Timber/Grazing, approximately 18 percent zoned for Grazing, and approximately 9 percent crosses lands zoned for Agriculture.

Military Training

Table 3-236 presents the affected environment for military training in special-use airspace for the alternatives and route variations in Segment 2.

Table 3-236. Military Training within the 1-Mile-Wide Study Corridor for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Military Training Routes (miles crossed)
Applicant's Proposed Action	33.8	3.1
Variation S2-A1	*2.8*	*2.8*
Variation S2-A2	*2.9*	*2.9*
Variation S2-B1	*3.7*	*0.0*
Variation S2-B2	*3.8*	*0.0*
Variation S2-C1	*9.3*	*0.0*
Variation S2-C2	*8.8*	*0.0*
Variation S2-E1	*2.3*	*0.0*
Variation S2-E2	*2.6*	*0.0*
Variation S2-F1	*12.1*	*0.0*
Variation S2-F2	*12.2*	*0.0*
Glass Hill	33.7	3.1
Variation S2-D1	*4.3*	*0.0*
Variation S2-D2	*4.1*	*0.0*
Mill Creek	34.0	3.2

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses through MTRs southwest of NWSTF Boardman. Military training routes are aerial corridors used solely by military aviation for training flights within

special-use airspace. The routes are the result of a joint venture between the FAA and the DoD to provide for high-speed, low-level military activities. Military training routes are divided into instrument routes, and visual routes. Unless noted on the air navigation chart, aircraft may fly as low as 100 to 110 feet above ground level in the B2H Project area along these routes. Special-use airspace in Segment 2 is used by Navy and other military organizations and is not limited to NWSTF Boardman operations. Map 3-3 shows the location of MTRs in the B2H Project area.

The existing environment pertaining to military training in special-use airspace for Variations S2-A1 and S2-A2 would be the same as the Applicant's Proposed Action Alternative. No other route variations are located within MTRs.

Glass Hill Alternative

The Glass Hill Alternative crosses through the same amount of MTRs southwest of NWSTF Boardman. Therefore, the existing environment pertaining to military training in special-use airspace would be the same as to the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2 are not located within any existing or proposed MTRs.

Mill Creek Alternative

The Mill Creek Alternative crosses through MTRs southwest of NWSTF Boardman. Therefore, the existing environment pertaining to military training in special-use airspace would be slightly less but similar to the Applicant's Proposed Action Alternative.

Specially Designated Areas

Specially designated areas are lands managed by federal or state agencies to protect values and land uses unique to an area. These areas typically require more intensive management emphasis than is applied to surrounding public lands. Specially designated areas are administratively designated. Administrative designations present in the B2H Project area are ACECs and RNAs. Other types of specially designated areas present in the B2H Project area include designations administered and managed by state natural resource and wildlife departments. These entities include missions to protect habitat, provide recreation and educational opportunities. These include Wildlife Areas.

Congressionally designated areas are described in Section 3.2.11; lands with wilderness characteristics are described in Section 3.2.10.

Area of Critical Environmental Concern

There are no ACECs present in the alternative route study corridors for Segment 2.

Research Natural Areas

There are no RNAs present in the alternative route study corridors for Segment 2.

Wildlife Areas

Wildlife areas managed by the ODFW exist in the Segment 2 study corridor. ODFW manages state wildlife areas primarily to provide wildlife habitat, with recreational use as an incidental benefit in some

locations. Public use for wildlife-oriented recreation is permitted in these areas, with some restrictions based on type of use, geographic extent, and/or season. Management plans are available for the Columbia Basin Wildlife Areas (Ladd Marsh Wildlife Area). The management plans focus on habitat and wildlife management and do not address management for visual resources.

Table 3-237 presents the specially designated areas and their relevant and important values and management prescriptions for all alternative routes and route variations in Segment 2.

Table 3-237. Specially Designated Areas within the 1-Mile-Wide Study Corridor for Segment 2—Blue Mountains

Relevant and Important Values	Management Prescriptions Relevant to Utility Rights-of-Way	Relevant Alternative Routes
Areas of Critical Environmental Concern		
There are no areas of critical environmental concern present in the alternative route study corridors in Segment 2.		
Research Natural Areas		
There are no research natural areas present in the alternative route study corridors in Segment 2.		
Wildlife Areas		
Ladd Marsh Wildlife Area		
One of the largest remaining wetlands in northeast Oregon established in 1949 with the primary objectives of protecting and improving nesting and migrating waterfowl habitat and providing a public hunting area. Part of the Columbia Basin Wildlife Area (Ladd Marsh Wildlife Area) which is a composition of four ODFW managed wildlife areas located along the Columbia River. This Wildlife Area is within the Blue Mountain ecoregion. This wildlife area has a significant land base well suited to support indigenous fish and wildlife species and migratory water birds. Wetland and associated uplands provide habitat for a diverse array of wildlife species. The habitat types found here are of quality and quantity to make a significant contribution to wildlife resources in this portion of Oregon. Goals of this Wildlife Area are: • Goal 1: To protect, enhance, and manage wetland habitats to benefit fish and wildlife species. • Goal 2: To protect, enhance, and manage upland habitats to benefit a wide variety of wildlife species. • Goal 3: To provide a variety of wildlife-oriented recreational and educational opportunities to the public which are compatible with Goals 1 and 2.	Managed by the ODFW in accordance with the *Ladd Marsh Wildlife Area Management Plan* and designated as a protected area in accordance with EFSC guidelines (ODFW 2008). The goals, objectives, and actions in this plan are derived following an ecosystem based management philosophy. This plan takes a strong habitat-based management approach with descriptions of wetland habitat types in plan goals and objectives. Of primary importance, most actions undertaken on this wildlife area are for the benefit of wildlife, and public use must be compatible with the wildlife resource. Numerous easements are associated with this wildlife area and include easements for pipeline and transmission lines, effluent treatment facilities, and wetland and restoration projects. Other agreements include cooperative management agreement between Rocky Mountain Elk Foundation and the ODFW, cooperative management agreement between the ODFW and City of La Grande, and sharecrop agreements for two permittees involving farming and grazing on the wildlife area.	• Variation S2-C2 • Mill Creek Alternative

Table Note: ODFW = Oregon Department of Fish and Wildlife

Applicant's Proposed Action Alternative

The 1-mile-wide study corridor for the Applicant's Proposed Action would not cross the Ladd Marsh Wildlife Area (Link 2-53).

Variations S2-A1, S2-A2, S2-B1, S2-B2, S2-C1, S2-E1, S2-E2, S2-F1, and S2-F2

The 1-mile-wide study corridor for these variations would not cross the Ladd Marsh Wildlife Area (Link 2-53).

Variation S2-C2

The Ladd Marsh Wildlife Area is within the 1-mile-wide study corridor for this variation (Link 2-53). Refer to Table 3-237 for information related to relevant and important values and management prescriptions for this area.

Glass Hill Alternative

The 1-mile-wide study corridor for the Glass Hill Alternative would not cross the Ladd Marsh Wildlife Area (Link 2-53).

Variations S2-D1 and S2-D2

The 1-mile-wide study corridor for these variations would not cross the Ladd Marsh Wildlife Area (Link 2-53).

Mill Creek Alternative

The Ladd Marsh Wildlife Area (Link 2-53) is within the 1-mile-wide study corridor for the Mill Creek Alternative. Refer to Table 3-237for information related to relevant and important values and management prescriptions for this area.

SEGMENT 3—BAKER VALLEY

Land Ownership, Utility Corridors, and Parallel Facilities

The study corridors in Segment 3 cross portions of two counties in Oregon and include a variety of ownership and management entities including federal, state, and local land-managing agencies. In addition, there are four incorporated cities, as well as numerous unincorporated communities, in the study corridors. Table 3-238 and Table 3-239 present the affected environment for land ownership and parallel facilities for the alternatives and route variations in Segment 3.

Table 3-238. Land Ownership within the 1-Mile-Wide Study Corridor for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Land Ownership (acres)						
		Bureau of Land Management	Bureau of Reclamation	Tribal	Department of Defense	U.S. Forest Service	State	Private
Applicant's Proposed Action	55.2	9,764	0	0	0	0	0	25,872
Variation S3-A1	*12.4*	*768*	*0*	*0*	*0*	*0*	*0*	*7,614*
Variation S3-A2	*12.2*	*496*	*0*	*0*	*0*	*0*	*0*	*7,791*
Variation S3-B1	*13.9*	*3,492*	*0*	*0*	*0*	*0*	*0*	*5,859*
Variation S3-B2	*14.4*	*625*	*0*	*0*	*0*	*0*	*0*	*9,083*
Variation S3-B3	*14.7*	*701*	*0*	*0*	*0*	*0*	*0*	*9,227*
Variation S3-B4	*14.3*	*458*	*0*	*0*	*0*	*0*	*0*	*9,117*
Variation S3-B5	*14.0*	*359*	*0*	*0*	*0*	*0*	*0*	*8,993*
Variation S3-C1	*21.1*	*4,663*	*0*	*0*	*0*	*0*	*0*	*9,317*
Variation S3-C2	*21.7*	*4,265*	*0*	*0*	*0*	*0*	*0*	*10,047*
Variation S3-C3	*21.1*	*4,428*	*0*	*0*	*0*	*0*	*0*	*9,512*
Variation S3-C4	*21.4*	*4,446*	*0*	*0*	*0*	*0*	*0*	*9,675*
Variation S3-C5	*21.0*	*5,176*	*0*	*0*	*0*	*0*	*0*	*8,737*
Variation S3-C6	*24.7*	*7,362*	*0*	*0*	*0*	*0*	*0*	*8,926*
Flagstaff A	55.3	6,631	0	0	0	0	0	29,001
Timber Canyon	70.3	4,879	0	0	0	11,828	0	28,667
Flagstaff A – Burnt River Mountain	55.3	6,396	0	0	0	0	0	29,196
Flagstaff B	56.0	6,973	0	0	0	0	0	29,234
Flagstaff B – Burnt River West	55.7	7,214	0	0	0	0	0	28,834
Flagstaff B – Durkee	59.6	9,672	0	0	0	0	0	28,843

There is one type of designated utility corridor (West-Wide Energy Corridor) in the study corridors for Segment 3 (refer to MV-12). There are no designated RMP corridors in the study corridors for Segment 3.

Existing linear energy-related facilities in the study corridors include transmission lines and pipelines. Table 3-239 provides a description of the major transmission line rights-of-way (69-kV and greater) relevant to the study corridors in Segment 3. As noted, pipelines also are considered an existing linear facility, and are included in the analysis of linear facilities. However the available data for this analysis are not refined enough to report by name, diameter, and owner. Refer to MV-12 for general location of utility corridors.

Table 3-239. Parallel Facilities within the 1-Mile-Wide Study Corridor for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Transmission Lines		
		Name	Voltage	Owner
Applicant's Proposed Action	55.2	Unknown	69 138 230	IPC IPC IPC
Variation S3-A1	*12.4*	*Unknown*	*230*	*IPC*
Variation S3-A2	*12.2*	*Unknown*	*230*	*IPC*
Variation S3-B1	*13.9*	*Unknown*	*69* *138* *230*	*IPC* *IPC* *IPC*
Variation S3-B2	*14.4*	*Unknown*	*69* *138* *230*	*IPC* *IPC* *IPC*
Variation S3-B3	*14.7*	*Unknown*	*69* *138* *230*	*IPC* *IPC* *IPC*
Variation S3-B4	*14.3*	*Unknown*	*69* *138* *230*	*IPC* *IPC* *IPC*
Variation S3-B5	*14.0*	*Unknown*	*69* *138* *230*	*IPC* *IPC* *IPC*
Variation S3-C1	*21.1*	*Unknown*	*69* *138*	*IPC* *IPC*
Variation S3-C2	*21.7*	*Unknown*	*69* *138*	*IPC* *IPC*
Variation S3-C3	*21.1*	*Unknown*	*69* *138*	*IPC* *IPC*
Variation S3-C4	*21.4*	*Unknown*	*69* *138*	*IPC* *IPC*
Variation S3-C5	*21.0*	*Unknown*	*69* *138*	*IPC* *IPC*
Variation S3-C6	*24.7*	*Unknown*	*69* *138*	*IPC* *IPC*
Flagstaff A	55.3	Unknown	69 138 230	*IPC* *IPC* IPC
Timber Canyon	70.3	Unknown	69 138 230	*IPC* *IPC* IPC
Flagstaff A – Burnt River Mountain	55.3	Unknown	69 138 230	*IPC* *IPC* IPC

Table 3-239. Parallel Facilities within the 1-Mile-Wide Study Corridor for Segment 3—Baker Valley				
Alternative Route	**Total Length (miles)**	**Transmission Lines**		
		Name	**Voltage**	**Owner**
Flagstaff B	56.0	Unknown	69 138 230	*IPC* *IPC* IPC
Flagstaff B – Burnt River West	55.7	Unknown	69 138 230	*IPC* *IPC* IPC
Flagstaff B – Durkee	59.6	Unknown	69 138 230	*IPC* *IPC* IPC
Table Note: IPC = Idaho Power Company				

Applicant's Proposed Action Alternative

The land ownership within the study corridor for the Applicant's Proposed Action, Variations S3-B1 and S3-C1 through C6 is predominately private and BLM.

The land ownership within the study corridor for Variations S3-A1, S3-A2, S3-B2, S3-B3, S3-B4, and S3-B5 is predominately private.

The land ownership within the study corridor for the Timber Canyon Alternative is predominately private USFS (Wallowa-Whitman National Forest), and some BLM.

The land ownership within the study corridor for the Flagstaff A Alternative, Flagstaff A – Burnt River Mountain Alternative, Flagstaff B Alternatives, Flagstaff B- Burnt River West Alternative and Flagstaff B – Durkee is predominately private and BLM.

Existing Land Use

Segment 3 begins in Baker County, approximately 3 miles east of North Powder and ends south of Dixie in Baker County. Table 3-240 presents acreages of existing land uses within the 1-mile-wide study corridor of the alternatives and route variations in Segment 3.

Table 3-240. Existing Land Use within the 1-Mile-Wide Study Corridor for Segment 3—Baker Valley							
Alternative Route	Total Acres	Existing Land Use (acres)					
		Agriculture	Bare Ground, Cliff, Talus	Developed/Disturbed	Forest/ Woodland	Grassland	Shrubland
Applicant's Proposed Action	35,633	1,023	578	535	479	3,138	29,880
Variation S3-A1	*8,379*	*304*	*8*	*23*	*68*	*404*	*7,572*
Variation S3-A2	*8,285*	*139*	*2*	*22*	*26*	*584*	*7,512*
Variation S3-B1	*9,351*	*0*	*13*	*85*	*235*	*562*	*8,456*
Variation S3-B2	*9,708*	*956*	*150*	*233*	*273*	*312*	*7,785*
Variation S3-B3	*9,928*	*1,010*	*153*	*251*	*195*	*298*	*8,021*
Variation S3-B4	*9,575*	*1,424*	*140*	*257*	*199*	*309*	*7,247*
Variation S3-B5	*9,352*	*1,302*	*138*	*237*	*277*	*328*	*7,070*
Variation S3-C1	*13,980*	*719*	*552*	*334*	*170*	*1,945*	*10,259*
Variation S3-C2	*14,312*	*954*	*596*	*569*	*188*	*2,085*	*9,919*
Variation S3-C3	*13,939*	*647*	*518*	*351*	*670*	*1,825*	*9,929*
Variation S3-C4	*14,121*	*511*	*564*	*354*	*725*	*1,881*	*10,085*
Variation S3-C5	*13,913*	*215*	*405*	*111*	*1,261*	*2,552*	*9,370*
Variation S3-C6	*16,288*	*280*	*608*	*106*	*1,913*	*2,378*	*11,003*
Flagstaff A	35,629	2,325	703	687	522	2,903	28,489
Timber Canyon	45,374	2,076	278	360	16,216	3,858	22,586
Flagstaff A – Burnt River Mountain	35,589	2,254	669	704	1,021	2,783	28,159
Flagstaff B	36,205	2,034	718	701	439	2,873	29,440
Flagstaff B – Burnt River West	36,046	1,365	564	477	1,487	3,660	28,492
Flagstaff B – Durkee	38,513	1,595	774	473	2,181	3,306	30,184
Table Note: This data is based on U.S. Geological Service GAP data.							

Table 3-241 presents existing structures within the 1-mile-wide study corridor of the alternatives and route variations in Segment 3.

Table 3-241. Existing Land Use Structures Crossed By or Adjacent to Alternative Routes and Route Variations in Segment 3—Baker Valley

Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	1 extraction-mining 2 outstructures	1 residential	2 campground facilities 1 extraction-mining 4 outstructures 3 residential	3 campground facilities 2 communication facilities 5 extraction-mining 9 outstructures 3 residential 2 rest stops	3 buildings (non-residence) 2 communication facilities 6 extraction-mining 30 outstructures 12 residential 1 school/educational facilities
Variation S3-A1	*1 outstructure*	*0*	*0*	*1 extraction-mining*	*1 extraction-mining* *1 outstructure*
Variation S3-A2	*0*	*0*	*0*	*1 outstructure*	*1 extraction-mining* *1 outstructure*
Variation S3-B1	*0*	*0*	*1 extraction-mining*	*2 extraction-mining* *2 outstructures*	*2 buildings (non-residence)* *2 extraction-mining* *3 outstructures*
Variation S3-B2	*0*	*1 outstructure*	*1 building (non-residence)* *2 extraction-mining* *3 outstructures* *2 residential*	*4 buildings (non-residence)* *3 extraction-mining* *6 outstructures* *3 residential*	*5 buildings (non-residence)* *19 outstructures* *6 residential*
Variation S3-B3	*1 extraction-mining*	*1 outstructure*	*1 building (non-residence)* *2 extraction-mining* *4 outstructures* *2 residential*	*4 buildings (non-residence)* *2 extraction-mining* *10 outstructures* *5 residential*	*5 buildings (non-residence)* *15 outstructures* *5 residential*
Variation S3-B4	*1 extraction-mining* *1 outstructure*	*1 outstructure*	*2 buildings (non-residence)* *2 extraction-mining* *4 outstructures* *2 residential*	*3 buildings (non-residence)* *1 extraction-mining* *22 outstructures* *5 residential*	*6 buildings (non-residence)* *1 extraction-mining* *15 outstructures* *5 residential*
Variation S3-B5	*2 outstructures*	*1 outstructure*	*2 buildings (non-residence)* *2 extraction-mining* *2 outstructures* *2 residential*	*3 buildings (non-residence)* *2 extraction-mining* *6 outstructures* *3 residential*	*5 buildings (non-residence)* *1 extraction-mining* *28 outstructures* *6 residential*

Table 3-241. Existing Land Use Structures Crossed By or Adjacent to Alternative Routes and Route Variations in Segment 3—Baker Valley

Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Variation S3-C1	*1 extraction-mining* *1 outstructure*	*1 residential*	*2 campground facilities* *4 outstructures* *3 residential*	*3 campground facilities* *2 communication facilities* *2 extraction-mining* *7 outstructures* *3 residential* *2 rest stops*	*2 communication facilities* *2 extraction-mining* *23 outstructures* *10 residential* *1 school/educational facilities*
Variation S3-C2	*1 extraction-mining* *1 outstructure*	*1 residential*	*2 campground facilities* *1 communication facility* *11 outstructures* *6 residential*	*2 buildings (non-residence)* *3 campground facilities* *1 communication facility* *2 extraction-mining* *1 outstructure* *3 residential* *2 rest stops*	*5 buildings (non-residence)* *2 communication facilities* *2 extraction-mining* *30 outstructures* *13 residential* *2 school/educational facilities*
Variation S3-C3	*1 building (non-residence)* *2 extraction-mining* *1 outstructure*	*4 outstructures* *2 residential*	*2 campground facilities* *7 outstructures* *3 residential* *1 rest stop*	*3 campground facilities* *1 communication facility* *1 extraction-mining* *9 outstructures* *1 residential* *1 rest stop*	*4 buildings (non-residence)* *1 communication facility* *1 extraction-mining* *17 outstructures* *7 residential*
Variation S3-C4	*1 building (non-residence)* *2 extraction-mining* *1 outstructure*	*4 outstructures* *2 residential*	*2 campground facilities* *7 outstructures* *3 residential* *1 rest stop*	*3 campground facilities* *1 communication facility* *1 extraction-mining* *9 outstructures* *1 residential* *1 rest stop*	*3 buildings (non-residence)* *1 communication facility* *1 extraction-mining* *13 outstructures* *5 residential*
Variation S3-C5	*0*	*1 outstructure*	*0*	*3 outstructures* *2 residential*	*2 outstructures* *1 residential*
Variation S3-C6	*0*	*0*	*1 outstructure*	*1 other* *5 outstructures* *3 residential*	*0*

Table 3-241. Existing Land Use Structures Crossed By or Adjacent to Alternative Routes and Route Variations in Segment 3—Baker Valley

Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Flagstaff A	1 extraction-mining 4 outstructures	1 outstructure 1 residential	2 buildings (non-residence) 2 campground facilities 2 extraction-mining 6 outstructures 5 residential	3 buildings (non-residence) 3 campground facilities 2 communication facilities 5 extraction-mining 13 outstructures 6 residential 2 rest stops	6 buildings (non-residence) 2 communication facilities 5 extraction-mining 55 outstructures 18 residential 1 school/educational facilities
Timber Canyon	3 buildings (non-residence) 1 communication facility 1 extraction-mining 2 outstructures 1 residential	1 outstructure 3 residential	5 buildings (non-residence) 2 campground facilities 15 outstructures 9 residential	7 buildings (non-residence) 3 campground facilities 2 extraction-mining 26 outstructures 10 residential 2 rest stops	11 buildings (non-residence) 2 communication facilities 1 extraction-mining 75 outstructures 26 residential 1 school/educational facilities 4 windmills
Flagstaff A – Burnt River Mountain	1 building (non-residence) 2 extraction-mining 4 outstructures	5 outstructures 2 residential	2 buildings (non-residence) 2 campground facilities 2 extraction-mining 9 outstructures 5 residential 1 rest stop	3 buildings (non-residence) 3 campground facilities 1 communication facility 4 extraction-mining 15 outstructures 4 residential 1 rest stop	10 buildings (non-residence) 1 communication facility 4 extraction-mining 49 outstructures 15 residential
Flagstaff B	2 extraction-mining 2 outstructure	1 outstructure 1 residential	1 building (non-residence) 2 campground facilities 2 extraction-mining 8 outstructures 5 residential	4 buildings (non-residence) 3 campground facilities 2 communication facilities 5 extraction-mining 17 outstructures 8 residential 2 rest stops	6 buildings (non-residence) 2 communication facilities 4 extraction-mining 42 outstructures 17 residential 1 school/educational facilities

Table 3-241. Existing Land Use Structures Crossed By or Adjacent to Alternative Routes and Route Variations in Segment 3—Baker Valley					
Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Flagstaff B – Burnt River West	1 extraction-mining	2 outstructures	1 building (non-residence) 2 extraction-mining 4 outstructures 2 residential	4 buildings (non-residence) 2 extraction-mining 14 outstructures 7 residential	6 buildings (non-residence) 2 extraction-mining 21 outstructures 8 residential
Flagstaff B – Durkee	1 extraction-mining 1 outstructure	1 outstructure	1 building (non-residence) 2 extraction-mining 5 outstructures 2 residential	4 buildings (non-residence) 3 extraction-mining 1 other 15 outstructures 8 residential	6 buildings (non-residence) 2 extraction-mining 19 outstructures 7 residential

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative in Segment 3 crosses unincorporated portions of Baker County, Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas predominantly composed of shrubland, interspersed with forest, and grasslands. Areas of agriculture and farming and developed land generally associated with highways and roads occur throughout the study corridor. The Applicant's Proposed Action Alternative crosses through rural residential areas near the unincorporated communities of Pleasant Valley, Durkee, Weatherby and Dixie. The 1-mile-wide study corridor for this alternative crosses approximately 1023 acres (or 3 percent) of lands associated with agricultural production and approximately 535 acres (or 2 percent) of developed lands (Table 3-240). The remaining 34,075 acres (or 96 percent) in this study corridor are undeveloped shrubland, forest, and grass lands. Approximately 92 structures, including 19 residences, occur within 0.5 mile of the reference centerline of this alternative. One residence is located within the proposed right-of-way, and 3 structures (2 outstructures, 1 structure associated with mining) are crossed by the reference centerline (Table 3-241).

Variation S3-A1

Variation S3-A1 is approximately 12.3 miles long, and is located approximately 3.5 miles east of the community of North Powder along Links 3-4 and 3-22 of the Applicant's Proposed Action Alternative. Existing land uses within the study corridor for this variation can generally be characterized as vacant undeveloped areas predominantly composed of shrubland, interspersed with forest, and grasslands. Locations of agriculture and farming and developed land generally associated with mining occur within this study corridor. Four structures are located within 0.5 mile of the reference centerline of this variation, and one outstructure is crossed by the reference centerline.

Variation S3-A2

Variation S3-A2 is similar in length and existing land use characteristics to Variation S3-A1. Three structures are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S3-B1

Variation S3-B1 is approximately 2.9 miles long, and is located approximately 5.9 miles east of the Baker City along Links 3-26 and 3-28 of the Applicant's Proposed Action Alternative. Existing land uses within the study corridor for this variation can generally be characterized as vacant undeveloped areas predominantly composed of shrubland, interspersed with forest, grasslands, and developed land generally associated with agriculture and mining within this study corridor. Approximately 12 structures are located within 0.5 mile of the reference centerline of this variation. One of these structures is associated with the NHOTIC. Variation S3-B1 crosses approximately 0.5 mile east of the NHOTIC. No structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S3-B2

Variation S3-B2 is approximately 14.4 miles long, and is located approximately 3.3 miles east of Baker City. Within the study corridor for this variation existing land use characteristics are similar to Variation S3-B1 except for a higher proportion of agricultural lands and rural residences east of Baker City. Approximately 55 structures, including 11 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation one outstructure is located within the proposed right-of-way. No structures are crossed by the reference centerline.

Variation S3-B3

Variation S3-B3 is approximately 14.8 miles long, and is located approximately 3.1 miles east of Baker City. Within the study corridor for this variation existing land use characteristics are similar to Variation S3-B1 except for a higher proportion of agricultural lands and rural residences east of Baker City. Approximately 57 structures, including 12 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation one outstructure is located within the proposed right-of-way, and one mining structure is crossed by the reference centerline.

Variation S3-B4

Variation S3-B4 is approximately 14.2 miles long, and is located approximately 3.1 miles east of Baker City. Within the study corridor for this variation existing land use characteristics are similar to Variation S3-B1 except for a higher proportion of agricultural lands and rural residences east of Baker City. Approximately 71 structures, including 12 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation one outstructure is located within the proposed right-of-way, and one outstructure and one mining structure are crossed by the reference centerline.

Variation S3-B5

Variation S3-B5 is approximately 13.9 miles long, and is located approximately 3.3 miles east of Baker City. Within the study corridor for this variation existing land use characteristics are similar to Variation S3-B1 except for a higher proportion of agricultural lands and rural residences east of Baker City.

Approximately 65 structures, including 11 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation 1 outstructure is located within the proposed right-of-way, and 2 oustructures are crossed by the reference centerline.

Variation S3-C1

Variation S3-C1 is approximately 21.1 miles long, and is located generally parallel to Highway 30 approximately 1.7 miles northeast of Durkee, approximately 0.5 mile east of Weatherby, along Links 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, 3-92 of the Applicant's Proposed Action Alternative. Existing land uses within the study corridor for this variation can generally be characterized as vacant undeveloped areas predominantly composed of shrubland, and grassland interspersed with forest, and talus slopes. Agricultural lands, rural, residential, and other developed land generally associated with roads also are located within this study corridor. Approximately 69 structures, including 17 residences, 2 rest stops, 5 campground structures, and 1 educational facility, are located within 0.5 mile of the reference centerline of this variation. Along this variation 1 residence is located within the proposed right-of-way and 2 structures (1 mining structure, 1 outstructure) are crossed by the reference centerline.

Variation S3-C2

Variation S3-C2 is approximately 21.7 miles long, and is similar to S3-C1. Within the study corridor for this variation existing land use characteristics are similar to Variation S3-C1 except for a higher proportion of agricultural lands east of Durkee. Approximately 91 structures, including 23 residences, 2 rest stops, 5 campground structures, and 2 educational facilities, are located within 0.5 mile of the reference centerline of this variation. Along this variation 1 residence is located within the proposed right-of-way and 2 structures (1 mining structure, 1 outstructure) are crossed by the reference centerline.

Variation S3-C3

Variation S3-C3 is approximately 21.0 miles long, and is similar to S3-C1. Within the study corridor for this variation existing land use characteristics are similar to Variation S3-C1. Approximately 69 structures, including 13 residences, 2 rest stops, and 5 campground structures, are located within 0.5 mile of the reference centerline of this variation. Along this variation 2 residences and 4 oustructures are located within the proposed right-of-way and 4 structures (two mining structures, one outstructure, and one non-residential building) are crossed by the reference centerline. Approximately 3.5 miles southeast of Durkee, Link 3-72 of the reference centerline crosses a narrow portion of the Ash Grove Cement Plant mining facilities.

Variation S3-C4

Variation S3-C4 is approximately 21.3 miles long, and is similar to existing land use characteristics to S3-C1 with the exception of where this variation crosses less agricultural land and more forested lands west of Durkee. Approximately 62 structures, including 11 residences, 5 campground structures, and 2 rest stops, are located within 0.5 mile of the reference centerline of this variation. Along this variation 2 residences and 4 outstructures are located within the proposed right-of-way and 4 structures (2 mining structures, 1 outstructure, and 1 non-residential building) are crossed by the reference centerline.

Approximately 3.5 miles southeast of Durkee, Link 3-72 of the reference centerline crosses a narrow portion of the Ash Grove Cement Plant mining facilities.

Variation S3-C5

Variation S3-C5 is approximately 21.0 miles long, and is similar to existing land use characteristics to S3-C1 with the exception of where this variation crosses less agricultural land and more forested lands west of Durkee. Approximately nine structures, including three residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation one outstructure is located within the proposed right-of-way. No structures are crossed by the reference centerline.

Variation S3-C6

Variation S3-C6 is approximately 24.7 miles long, and is similar to existing land use characteristics to S3-C1 with the exception of where this variation crosses less agricultural lands more forested and shrublands west of Durkee. Approximately 10 structures, including 3 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way, or are crossed by the reference centerline.

Flagstaff A Alternative

The Flagstaff A Alternative in Segment 3 crosses unincorporated portions of Baker County, Oregon. Within the study corridor for this alternative, existing land use characteristics are similar to the Applicant's Proposed Action Alternative and Variation S3-B2. The 1-mile-wide study corridor for this alternative crosses approximately 2,325 acres (or 7 percent) of lands associated with agricultural production and approximately 687 acres (or 2 percent) of developed lands (Table 3-240). The remaining 32,617 acres (or 92 percent) in this study corridor are undeveloped shrubland, and grasslands. Approximately 145 structures occur within 0.5 mile of the reference centerline of this alternative. Of these, 1 residence is located within the proposed right-of-way, and 5 structures (4 outstructures and 1 structure associated with mining) are crossed by the reference centerline (Table 3-241).

Timber Canyon Alternative

The Timber Canyon Alternative in Segment 3 crosses unincorporated portions of Union and Baker counties in Oregon and is the longest of the Segment 3 alternatives. Within the study corridor for this alternative, existing land use characteristics are similar to the Applicant's Proposed Action Alternative except for the increase of approximately 15,700 acres of forested lands, and an increase of approximately 1,000 acres of agricultural lands. The 1-mile-wide study corridor for this alternative crosses approximately 2,076 acres (or 5 percent) of lands associated with agricultural production and approximately 360 acres (or 1 percent) of developed lands (Table 3-240). The remaining 42,938 acres (or 95 percent) in this study corridor are undeveloped shrubland, forested lands, and grasslands. Approximately 213 structures occur within 0.5 mile of the reference centerline of this alternative. Of these, 4 structures (3 residences and 1 outstructure) are within the proposed right-of-way and 8 structures, including 1 residence, are crossed by the reference centerline (Table 3-241).

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative in Segment 3 crosses unincorporated portions of Baker County, Oregon. Within the study corridor for this alternative, existing land use characteristics are similar to the Applicant's Proposed Action Alternative and Variation S3-B2. The 1-mile-wide study corridor for this alternative crosses approximately 2,254 acres (or 6 percent) of lands associated with agricultural production and approximately 704 acres (or 2 percent) of developed lands (Table 3-240). The remaining 32,631 acres (or 92 percent) in this study corridor are undeveloped shrubland, grasslands, forest woodland. Approximately 145 structures occur within 0.5 mile of the reference centerline of this alternative, including 26 residences, 2 campground structures, and 2 rest stops. Of these, 7 structures (2 residences and 5 outstructures) are located within the proposed right-of-way, and 7 structures (4 outstructures, 2 structure associated with mining, and 1 non-residential building) are crossed by the reference centerline (Table 3-241).

Flagstaff B Alternative

The Flagstaff B Alternative in Segment 3 crosses unincorporated portions of Baker County, Oregon. Within the study corridor for this alternative, existing land use characteristics are similar to the Applicant's Proposed Action Alternative and Variation S3-B2. The 1-mile-wide study corridor for this alternative crosses approximately 2,034 acres (or 6 percent) of lands associated with agricultural production and approximately 701 acres (or 2 percent) of developed lands (Table 3-240). The remaining 33,470 acres (or 92 percent) in this study corridor are undeveloped shrubland, grasslands, bare ground, and forest woodland. Approximately 137 structures occur within 0.5 mile of the reference centerline of this alternative, including 31 residences, 2 rest stops, and 1 educational facility. Of these, 2 structures (1 residence, 1 oustructure) are located within the proposed right-of-way, and 4 structures (2 outstructures and 2 structures associated with mining) are crossed by the reference centerline (Table 3-241).

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative in Segment 3 crosses unincorporated portions of Baker County, Oregon. Within the study corridor for this alternative, existing land use characteristics are similar to the Applicant's Proposed Action Alternative except for an increase of forested lands. The 1-mile-wide study corridor for this alternative crosses approximately 1,365 acres (or 4 percent) of lands associated with agricultural production and approximately 477 acres (or 2 percent) of developed lands (Table 3-240). The remaining 34,204 acres (or 95 percent) in this study corridor are undeveloped shrubland, grasslands, forest woodland and bare ground. Approximately 76 structures occur within 0.5 mile of the reference centerline of this alternative, including 17 residences. Of these, 1 outstructure is located within the proposed right-of-way, and 2 structures (1 outstructure, 1 structure associated with mining) are crossed by the reference centerline (Table 3-241).

Flagstaff B – Durkee

The Flagstaff B – Durkee Alternative in Segment 3 crosses unincorporated portions of Baker County, Oregon. Within the study corridor for this alternative, existing land use characteristics are similar to the Applicant's Proposed Action Alternative except for an increase of the amount of agricultural and

forested lands. The 1-mile-wide study corridor for this alternative crosses approximately 1,595 acres (or 4 percent) of lands associated with agricultural production and approximately 473 acres (or 2 percent) of developed lands (Table 3-240). The remaining 36,445 acres (or 95 percent) in this study corridor are undeveloped shrubland, grasslands, forest woodland. Approximately 78 structures occur within 0.5 mile of the reference centerline of this alternative, including 17 residences. Of these, 1 outstructure is located within the proposed right-of-way, and 2 structures (1 outstructure and 1 structure associated with mining) are crossed by the reference centerline (Table 3-241).

Timber Management

Table 3-242 presents the affected environment for timber management for the alternatives and route variations in Segment 3.

Table 3-242. Timber Management within the 1-Mile-Wide Study Corridor for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Aspen	Forest-Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Total
Applicant's Proposed Action	55.2	0.0	0.0	0.0	0.0	0.0
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.3*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.7*	*0.0*	*0.7*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.7*	*0.0*	*0.7*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.4*	*0.9*	*1.3*
Variation S3-C6	*24.7*	*0.5*	*0.0*	*0.9*	*1.5*	*2.9*
Flagstaff A	55.3	0.0	0.0	0.3	0.0	0.3
Timber Canyon	70.3	0.3	0.0	0.9	19.4	20.6
Flagstaff A – Burnt River Mountain	55.3	0.0	0.0	1.0	0.0	1.0
Flagstaff B	56.0	0.0	0.0	0.3	0.0	0.3
Flagstaff B – Burnt River West	55.7	0.0	0.0	0.7	0.9	1.6
Flagstaff B – Durkee	59.6	0.5	0.0	1.2	1.5	3.2

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative in Segment 3 does not cross forested lands.

Other Alternative Routes and Variations in Segment 3

Forested lands in Segment 3 are primarily located in northern and southern Baker County, on private lands and the Wallowa-Whitman National Forest. The timber resources, where present, are similar

among all other alternative routes and variations in Segment 3 (Table 3-242), with the exception of the Timber Canyon Alternative route which is discussed separately.

Timber Canyon Alternative

The Timber Canyon Alternative crosses approximately 20.6 miles of forested lands, primarily Mixed Conifer Forest. The Timber Canyon Alternative crosses timber management areas in the Wallowa-Whitman National Forest, as well as small areas of forest on private lands adjacent to the national forest boundary.

Fire Management

This section presents information on recent fire history, using available data dating from 2000 through 2015. All other aspects of the affected environment for fire management are considered to be common to all alternatives. Refer to Section 3.2.3 for additional information on fire ecology.

Applicant's Proposed Action Alternative

Near Baker City, the Applicant's Proposed Action Alternative crosses an area affected by several historical fires that burned in or near the same location. These were the 2001 White Swan Fire (1,485 acres), 2007 Pleasant Valley Fire (2,904 acres), and the 2014 Radio Tower Fire (3,359 acres). Additionally, the large 2015 Cornet Windy Ridge Fire burned 103,906 acres near the Applicant's Proposed Action Alternative, up to Interstate 84 in the vicinity of the other fires listed.

Variations S3-A1 and S3-A2 and S3-C1 through S3-C5

No recently burned areas are crossed by these variations.

Variation S3-B1

This variation crosses the same previously burned areas as the Applicant's Proposed Action Alternative.

Variations S3-B2 through S3-B5

These variations cross the previously burned areas discussed under the Applicant's Proposed Action Alternative, but in slightly different locations.

Variation S3-C6

Variation S3-C6 crosses near an area burned by the small 2000 Sunday Hill Fire (204 acres).

Flagstaff A Alternative

The Flagstaff A Alternative crosses the previously burned areas discussed under the Alternative, but in a slightly different location.

Timber Canyon Alternative

No recently burned areas are crossed by this alternative.

Flagstaff A – Burnt River Mountain Alternative

No recently burned areas are crossed by this alternative.

Flagstaff B Alternative

The Flagstaff B Alternative crosses the previously burned areas discussed under the Applicant's Proposed Action Alternative , but in a slightly different location.

Flagstaff B – Burnt River West Alternative

No recently burned areas are crossed by this alternative.

Flagstaff B – Durkee

The Flagstaff B – Durkee Alternative crosses near an area burned by the small 2000 Sunday Hill Fire (204 acres).

Zoning

The following is an inventory of the generalized zoning classifications for each alternative and route variation in Segment 3. Refer to Section 3.2.6.4 for a description of the generalized zoning types, and MV-14 for their locations.

Applicant's Proposed Action Alternative

Approximately 99 percent of the Applicant's Proposed Action Alternative crosses lands zoned for Agriculture and approximately 1 percent zoned for Industrial.

Variation S3-A1 and S3-A2, S3-B2 through S3-B5, and S3-C1

Approximately 100 percent of these variations cross lands zoned for Agriculture.

Variation S3-B1

Approximately 98 percent of the Variation S3-B1 crosses lands zoned for Agriculture and 2 percent crosses lands zoned for Industrial.

Variation S3-C2

Approximately 99 percent of the Variation S3-C2 crosses lands zoned for Agriculture, and 1 percent cross lands zoned for Commercial.

Variations S3-C3 and S3-C4

Approximately 96 percent of these variations cross lands zoned for Agriculture and 4 percent cross lands zoned for Industrial.

Variation S3-C6

Approximately 94 percent of the Variation S3-C6 crosses lands zoned for Agriculture, 5 percent for Timber/Grazing and 1 percent cross lands zoned for Industrial.

Flagstaff A Alternative

Approximately 100 percent of the Flagstaff A Alternative crosses lands zoned for Agriculture.

Timber Canyon Alternative

Approximately 54 percent of the Timber Canyon Alternative crosses lands zoned for Agriculture and approximately 24 percent zoned for Federal. Other zones crossed include Grazing and Timber/Grazing.

Flagstaff A – Burnt River Mountain Alternative

Approximately 99 percent of the Flagstaff A – Burnt River Mountain Alternative crosses lands zoned for Agriculture and approximately 1 percent zoned for Industrial.

Flagstaff B Alternative

Approximately 100 percent of the Flagstaff B Alternative crosses lands zoned for Agriculture.

Flagstaff B – Burnt River West Alternative

Approximately 99 percent of the Flagstaff A – Burnt River Mountain Alternative crosses lands zoned for Agriculture and approximately 1 percent zoned for Industrial.

Flagstaff B – Durkee

Approximately 98 percent of the Flagstaff B – Durkee Alternative crosses lands zoned for Agriculture and approximately 2 percent zoned for Timber/Grazing.

Military Training

Table 3-243 presents the affected environment for military training in special-use airspace for the alternatives and route variations in Segment 3.

Table 3-243. Military Training within the 1-Mile-Wide Study Corridor for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Military Training Routes (miles crossed)
Applicant's Proposed Action	55.2	18.4
Variation S3-A1	*12.4*	*0.0*
Variation S3-A2	*12.2*	*0.0*
Variation S3-B1	*13.9*	*0.0*
Variation S3-B2	*14.4*	*0.0*
Variation S3-B3	*14.7*	*0.0*
Variation S3-B4	*14.3*	*0.0*
Variation S3-B5	*14.0*	*0.0*
Variation S3-C1	*21.1*	*18.4*
Variation S3-C2	*21.7*	*19.0*
Variation S3-C3	*21.1*	*18.5*
Variation S3-C4	*21.4*	*18.8*
Variation S3-C5	*21.0*	*17.0*
Variation S3-C6	*24.7*	*16.4*
Flagstaff A	55.3	18.4
Timber Canyon	70.3	13.6
Flagstaff A – Burnt River Mountain	55.3	18.5
Flagstaff B	56.0	18.4
Flagstaff B – Burnt River West	55.7	17.0
Flagstaff B – Durkee	59.6	16.4

Applicant's Proposed Action Alternative

The Applicant's Proposed Action crosses through training routes within special-use airspace south of Baker City. Military training routes are aerial corridors used solely by military aviation for training flights. The routes are the result of a joint venture between the FAA and the DoD to provide for high-speed, low-level military activities. Military Training Routes are divided in to instrument routes, and visual routes. Unless noted on the air navigation chart, aircraft may fly as low as 100 to 110 feet above ground level in the B2H Project area along these routes. Special-use airspace in Segment 3 is used by Navy and other military organizations and is not limited to NWSTF Boardman operations. Map 3-3 shows the location of MTRs in the B2H Project area.

The existing environment pertaining to military training in special-use airspace for Variation S3-C1, S3-C2, S3-C3, S3-C4, S3-C5, S3-C5, and S3-C6 would be the same as the Applicant's Proposed Action Alternative. No other route variations are located within any existing or proposed MTRs.

Flagstaff A Alternative

The existing environment pertaining to military training routes in special-use airspace for the Flagstaff A Alternative would be the same as the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The existing environment pertaining to military training in special-use airspace for the Timber Canyon Alternative would be less, but similar to the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

The existing environment pertaining to military training routes in special-use airspace for the Flagstaff A – Burnt River Mountain Alternative would slightly more, but similar to the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The existing environment pertaining to military training in special-use airspace would slightly less, but similar to the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The existing environment pertaining to military training in special-use airspace would similar but slightly less than the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

The existing environment pertaining to military training in special-use airspace would be similar but slightly less than the Applicant's Proposed Action Alternative.

Specially Designated Areas

Specially designated areas are lands managed by federal or state agencies to protect values and land uses unique to an area. These areas typically require more intensive management emphasis than is applied to surrounding public lands. Specially designated areas are administratively designated. Administrative designations present in the B2H Project area are ACECs and RNAs. Other types of

specially designated areas present in the B2H Project area include designations administered and managed by state natural resource and wildlife departments. These entities include missions to protect habitat, provide recreation and educational opportunities. These include Wildlife Areas.

Congressionally designated areas are described in Section 3.2.11; lands with wilderness characteristics are described in Section 3.2.10.

Area of Critical Environmental Concern/Research Natural Area

The BLM designates ACECs where special management attention is needed to protect, and prevent irreparable damage to, important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes to protect human life and safety from natural hazards (BLM 1988).

There is one ACEC in Segment 3. The Oregon Trail ACEC (multiple parcels), is managed under the current 1989 Baker Field Office RMP. This ACEC is located within the 1 mile analysis area but is not within the 250 foot right-of-way. Refer to map MV-15.

Wildlife Areas

There are no wildlife areas present in the alternative route study corridors in Segment 3. Table 3-244 presents the specially designated areas and their relevant and important values and management prescriptions for the alternatives and route variations in Segment 3.

Table 3-244. Specially Designated Areas within the 1-Mile-Wide Study Corridor for Segment 3—Baker Valley

Relevant and Important Values	Management Prescriptions Relevant to Utility Rights-of-Way	Relevant Alternative Routes[1]
Areas of Critical Environmental Concern		
Oregon Trail ACEC (Multiple Parcels: Chimney Creek, Straw Ranch I, Straw Ranch II, White Swan, Flagstaff Hill, California Gulch, Echo Meadows)		
Historic values and the development and maintenance of the proposed National Historic Oregon Trail Interpretive Center. Resources within this area will be managed to maintain and enhance a developed Interpretive Center and ACEC.	New uses incompatible with maintain visual qualities or providing public interpretation will be excluded in a 0.5 mile corridor. Rights-of-way will avoid the Oregon Trail. Avoidance area for rights-of-way. No new road access will be developed.	• Applicant's Proposed Action • Variations S3-B1 through S3-B5 • Variation S3-C1 through S3-C6 • Flagstaff A • Flagstaff A – Burnt River Mountain • Timber Canyon • Flagstaff B • Flagstaff B – Burnt River West • Flagstaff B – Durkee
Research Natural Areas		
There are no RNAs present in the alternative route study corridors in Segment 3.		
Wildlife Areas		
There are no Wildlife Areas present in the alternative route study corridors in Segment 3.		

Applicant's Proposed Action Alternative

The Oregon Trail ACEC (Flagstaff Hill, Straw Ranch I, and Chimney Creek parcels) is within the 1-mile-wide study corridor for the Applicant's Proposed Action Alternative, but is not within the 250 foot right-

of-way. Refer to Table 3-244 for information related to relevant and important values and management prescriptions for these areas.

Variations S3-A1 and S3-A2

There are no existing specially designated areas within the 1-mile wide study corridor for these variations.

Variations S3-B1 through S3-B5

The Oregon Trail ACEC (Flagstaff Hill parcel) is within the 1 mile analysis area but is not within the 250 foot right-of-way for these variations.

Variation S3-C1 through S3-C6

The Oregon Trail ACEC (Chimney Creek parcel) is within the 1-mile-wide study corridor for these variations. This ACEC is located within the 1 mile analysis area but is not within the 250 foot right-of-way.

Flagstaff A Alternative

The affected environment for the Flagstaff A Alternative is the same as that described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

The Oregon Trail ACEC (Chimney Creek parcel) is within the 1 mile analysis area but is not within the 250 foot right-of-way for the Timber Canyon Alternative.

Flagstaff A – Burnt River Mountain Alternative

The affected environment for the Flagstaff A – Burnt River Mountain Alternative is the same as that described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The affected environment for the Flagstaff B Alternative is the same as that described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

The affected environment for the Flagstaff B – Burnt River West Alternative is the same as that described for the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

The affected environment for the Flagstaff B – Burnt River West Alternative is the same as that described for the Applicant's Proposed Action Alternative.

SEGMENT 4—BROGAN

Land Ownership, Utility Corridors, and Parallel Facilities

The study corridors in Segment 4 cross portions of two counties in Oregon and include a variety of ownership and management entities, including federal, state, and local land-managing agencies. There are no incorporated cities in the Segment 4 study corridor however many unincorporated communities

do exist within the study corridor. Table 3-245 and Table 3-246 present the affected environment for land ownership and parallel facilities for the alternative routes and route variations in Segment 4.

Table 3-245. Land Ownership within the 1-Mile-Wide Study Corridor for Segment 4—Brogan

Alternative Route	Total Length (miles)	Land Ownership (acres)						
		Bureau of Land Management	Bureau of Reclamation	Tribal	Department of Defense	U.S. Forest Service	State	Private
Applicant's Proposed Action	40.1	12,308	0	0	0	0	1,823	12,101
Variation S4-A1	*5.9*	*603*	*0*	*0*	*0*	*0*	*0*	*3,691*
Variation S4-A2	*6.0*	*692*	*0*	*0*	*0*	*0*	*0*	*3,588*
Variation S4-A3	*6.1*	*744*	*0*	*0*	*0*	*0*	*0*	*3,572*
Tub Mountain South	40.5	15,637	23	0	0	0	0	10,644
Willow Creek	34.6	10,374	0	0	0	0	0	12,252

There is one West-Wide Energy Utility Corridor and one RMP corridor in the study corridors for Segment 4 (refer to MV-12).

Existing linear energy-related facilities in the study corridors include transmission lines and pipelines. Table 3-246 provides a description of the major transmission line rights-of-way (69-kV and greater) relevant to the study corridors in Segment 4. As noted, pipelines also are considered an existing linear facility, and are included in the analysis of linear facilities. However the available data for this analysis are not refined enough to report by name, diameter, and owner. Refer to MV-12 for general location of utility corridors.

Table 3-246. Parallel Facilities within the 1-Mile-Wide Study Corridor for Segment 4—Brogan

Alternative Route	Total Length (miles)	Transmission Lines		
		Name	Voltage (kilovolt)	Owner
Applicant's Proposed Action	40.1	Unknown Unknown	69 138	IPC IPC
Variation S4-A1	*5.9*	*Unknown*	*69* *138*	*IPC* *IPC*
Variation S4-A2	*6.0*	*Unknown*	*69* *138*	*IPC* *IPC*
Variation S4-A3	*6.1*	*Unknown*	*69* *138*	*IPC* *IPC*
Tub Mountain South	40.5	*Unknown*	*69* *138*	*IPC* *IPC*
Willow Creek	34.6	*Unknown*	*69* *138*	*IPC* *IPC*

Table Notes: IPC = Idaho Power Company

Applicant's Proposed Action Alternative

Table 3-245 and Table 3-246 present the land ownership and parallel facilities for the Applicant's Proposed Action Alternative. The land ownership within the study corridor for this alternative is predominately private and BLM. However, the Applicant's Proposed Action does also cross Oregon Department of State Lands in Baker and Malheur counties.

The land ownership within the study corridor for Variation S4-A1, Variation S4-A2, and Variation S4-A3 is predominately private.

The land ownership within the study corridor for the Tub Mountain Alternative and the Willow Creek Alternative is predominately BLM and private.

Existing Land Use

Segment 4 begins south of Dixie in Baker County and ends south of Jamieson in Malheur County. Table 3-247 presents acreages of existing land uses within the 1-mile-wide study corridor of the alternatives and route variations in Segment 4.

Table 3-247. Existing Land Use within the 1-Mile-Wide Study Corridor for Segment 4—Brogan

Alternative Route	Total Acres	Existing Land Use (acres)					
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland
Applicant's Proposed Action	26,227	101	1,045	111	57	11,365	13,548
Variation S4-A1	*4,294*	*72*	*54*	*94*	*10*	*1,290*	*2,774*
Variation S4-A2	*4,281*	*108*	*39*	*162*	*13*	*1,234*	*2,724*
Variation S4-A3	*4,316*	*80*	*60*	*119*	*13*	*1,248*	*2,797*
Tub Mountain South	26,287	2,210	1,148	665	19	11,331	10,915
Willow Creek	22,625	1,291	1,030	171	38	8,005	12,091

Table Note: This data is based on U.S. Geological Service GAP data.

Table 3-248 presents existing structures within the 1-mile-wide study corridor of the alternatives and route variations in Segment 4.

Table 3-248. Existing Land Use Structures Crossed By or Adjacent to Alternatives and Route Segment 4—Brogan					
Alternative Route	**Crossed by the Reference Centerline**	**Within the Right-of-way**	**Distance from Reference Centerline**		
			0.125-mile	**0.126 to 0.25-mile**	**0.26 to 0.5-mile**
Applicant's Proposed Action	1 windmill	1 windmill	1 outstructure 1 windmill	1 extraction-mining 4 outstructures 2 residential 1 windmill	1 building (non-residence) 1 flood control facility 1 other 3 residential 1 windmill
Variation S4-A1	*0*	*0*	*0*	*3 outstructures* *2 residential*	*1 building (non-residence)* *1 other*
Variation S4-A2	*0*	*0*	*0*	*3 outstructures* *2 residential*	*1 building (non-residence)* *1 other*
Variation S4-A3	*0*	*0*	*0*	*0*	*1 building (non-residence)* *1 other* *3 outstructures* *2 residential*
Tub Mountain South	0	0	2 buildings (non-residence) 2 communication facilities 11 outstructures 4 residential	6 buildings (non-residence) 1 communication facility 24 outstructures 6 residential	12 buildings (non-residence) 1 communication facility 2 other 34 outstructures 19 residential
Willow Creek	1 windmill	0	1 other 1 outstructure 1 windmill	10 outstructures 4 residential	6 buildings (non-residence) 3 other 26 outstructures 3 residential 2 windmills

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative in Segment 4 crosses unincorporated portions of Baker and Malheur counties in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed primarily of shrubland, grassland, and bare ground. A small concentration of agriculture and farming occur near the unincorporated community of Dixie and where this alternative crosses Willow Creek, approximately 3 miles north of the unincorporated community of Brogan. The 1-mile-wide study corridor for this alternative crosses approximately 101 acres (less than 1 percent) of lands associated with agricultural production and approximately 111 acres (less than 1 percent) of developed lands (Table 3-247). The remaining 26,015 acres (or 99 percent) in this study corridor are primarily undeveloped shrublands, and grasslands.

Approximately 19 structures occur within 0.5 mile of the reference centerline of this alternative. One windmill is located within the proposed right-of-way and another windmill is crossed by the reference centerline (Table 3-248).

Variation S4-A1

Variation S4-A1 is approximately 5.9 miles long, and is located approximately 0.3 mile south of the community of Dixie along Links 4-1, 4-10, 4-11, and 4-13 of the Applicant's Proposed Action Alternative. The existing land use within the study corridor for this variation can generally be characterized as vacant undeveloped areas comprising forest, woodland, and shrublands with agricultural land uses near Dixie. Approximately seven structures, including two residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variations S4-A2 and S4-A3

The existing land uses located within the study corridor for Variations S4-A2 and S4-A3 are similar to those described for Variation S4-A1.

Tub Mountain South Alternative

The Tub Mountain South Alternative in Segment 4 crosses unincorporated portions of Baker and Malheur counties in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed primarily of shrubland, grassland, and concentrations of agriculture and rural residences near where this alternative crosses Willow Creek, approximately 4.4 miles southeast of the unincorporated community of Willow Creek. The 1-mile-wide study corridor for this alternative crosses approximately 2,210 acres (or 8 percent) of lands associated with agricultural production and approximately 665 acres (or 3 percent) of developed lands (Table 3-247). The remaining 23,412 acres (or 89 percent) in this study corridor are primarily undeveloped shrublands, grasslands, and bare ground. Approximately 124 structures, including 29 residences, occur within 0.5 mile of the reference centerline of this alternative, and no structures are located within the proposed right-of-way or are crossed by the reference centerline (Table 3-248).

Willow Creek Alternative

The Willow Creek Alternative in Segment 4 crosses unincorporated portions of Baker and Malheur counties in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed primarily of shrubland, grassland, and concentrations of agriculture and rural residences near where this alternative crosses Willow Creek, approximately 1.1 miles northwest of the unincorporated community of Jamieson. The 1-mile-wide study corridor for this alternative crosses approximately 1,291 acres (or 6 percent) of lands associated with agricultural production and approximately 171 acres (or 1 percent) of developed lands (Table 3-247). The remaining 21,163 acres (or 94 percent) in this study corridor are primarily undeveloped shrublands, grasslands, and bare ground. Approximately 58 structures, including 7 residences, occur within 0.5 mile of the reference centerline of this alternative. One windmill is crossed by the reference centerline, and no structures are located within the proposed right-of-way (Table 3-248).

Timber Management

No forested vegetation, and, thus, no timber resources, are present on any alternative route or variation in Segment 4.

Fire Management

This section presents information on recent fire history, using available data dating from 2000 through 2015. All other aspects of the affected environment for fire management are considered to be common to all alternatives. Refer to Section 3.2.3 for additional information on fire ecology.

Applicant's Proposed Action Alternative

Near Huntington, the Applicant's Proposed Action crosses an area affected by several historical fires that burned in or near the same location. These were the 2001 Cavanaugh 2 Fire (4,103 acres), 2005 Farewell Bend Fire (4,302 acres), 2008 Lime Fire (350 acres), and the 2015 Lime Hill Fire (12,024 acres). Near Brogan, the Applicant's Proposed Action crosses an area affected by the 2014 Kitten Complex Fire (22,700 acres).

Variation S4-A1

This variation crosses previously burned areas near Huntington that are the same as those crossed by the Applicant's Proposed Action Alternative.

Variation S4-A2

This variation crosses previously burned areas near Huntington similar to the Applicant's Proposed Action Alternative.

Variation S4-A3

This variation crosses previously burned areas near Huntington similar to the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The Tub Mountain South Alternative crosses areas affected by the 2006 Mud Springs Fire (14,631 acres) and the 2000 Jackson Fire (80,054 acres).

Willow Creek Alternative

The Willow Creek Alternative crosses areas affected by the 2006 Mud Springs Fire (14,631 acres) and the 2000 Jackson Fire (80,054 acres).

Zoning

The following is an inventory of the generalized zoning classifications for each alternative and route variation in Segment 4. Refer to Section 3.2.6.4 for a description of the generalized zoning types, and MV-14 for their locations.

Applicant's Proposed Action Alternative

Approximately 68 percent of the Applicant's Proposed Action Alternative crosses lands zoned for Grazing and approximately 32 percent zoned for Agriculture.

Variations S4-A1 through S4-A3

Approximately 100 percent of these variations cross crosses lands zoned for Agriculture.

Tub Mountain South Alternative

Approximately 65 percent of the Tub Mountain South Alternative crosses lands zoned for Grazing and approximately 35 percent zoned for Agriculture.

Willow Creek Alternative

Approximately 65 percent of the Willow Creek Alternative crosses lands zoned for Grazing and approximately 35 percent zoned for Agriculture.

Military Training

Table 3-249 presents the affected environment for existing land use for the alternatives and route variations in Segment 4.

Table 3-249. Military Training within the 1-Mile-Wide Study Corridor for Segment 4—Brogan

Alternative Route	Total Length (miles)	Military Training Routes (miles)
Applicant's Proposed Action	40.1	4.6
Variation S4-A1	*5.9*	*0.0*
Variation S4-A2	*6.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*
Tub Mountain South	40.5	0.0
Willow Creek	34.6	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action crosses through training routes northwest of Vale. Military training routes are aerial corridors used solely by military aviation for training flights within special-use airspace. The routes are the result of a joint venture between the FAA and the DoD to provide for high-speed, low-level military activities. Military training routes are divided in to instrument routes, and visual routes. Unless noted on the air navigation chart, aircraft may fly as low as 100 to 110 feet above ground level in the B2H Project area along these routes. Special-use airspace in Segment 4 is used by Navy and other military organizations and is not limited to NWSTF Boardman operations. Map 3-3 shows the location of MTRs in the B2H Project area.

Variations S4-A1 through S4-A3

These variations are not located within any existing or proposed MTRs.

Tub Mountain South Alternative

The Tub Mountain South Alternative is not located within any existing or proposed MTRs.

Willow Creek Alternative

The Willow Creek Alternative is not located within any existing or proposed MTRs.

Specially Designated Areas

Specially designated areas are lands managed by federal or state agencies to protect values and land uses unique to an area. These areas typically require more intensive management emphasis than is applied to surrounding public lands. Specially designated areas are administratively designated. Administrative designations present in the B2H Project area are ACECs and RNAs. Other types of specially designated areas present in the B2H Project area include designations administered and managed by state natural resource and wildlife departments. These entities include missions to protect habitat, provide recreation and educational opportunities. These include Wildlife Areas.

Congressionally designated areas are described in Section 3.2.11; lands with wilderness characteristics are described in Section 3.2.10.

Area of Critical Environmental Concern

The BLM designates ACECs where special management attention is needed to protect, and prevent irreparable damage to, important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes to protect human life and safety from natural hazards (BLM 1988). The Oregon National Historic Trail ACEC is located within Segment 4, refer to Table 3-250 for further detail. This ACEC is located within the 1 mile analysis area but is not within the 250 foot right-of-way.

Research Natural Areas

There are no RNAs present in the alternative route study corridors in Segment 4.

Wildlife Areas

There are no Wildlife Areas present in the alternative route study corridors in Segment 4.

Table 3-250 presents the specially designated areas and their relevant and important values and management prescriptions for the alternatives and route variations in Segment 4.

Table 3-250. Specially Designated Areas within the 1-Mile-Wide Study Corridor for Segment 4—Brogan

Name of Specially Designated Area	Relevant and Important Values	Management Prescriptions Relevant to Utility Rights-of-Way	Relevant Alternative Routes
Areas of Critical Environmental Concern			
Oregon Trail ACEC – Birch Creek parcel Birch Creek parcel Tub Mountain parcel	Historic and scenic values	Avoidance area for rights-of-way; granting rights-of-way (surface) within area should be avoided, but rights-of-way may be granted if there is minimal conflict with identified resource values and impacts can be mitigated.	• Tub Mountain South
Research Natural Areas			
There are no RNAs present in the alternative route study corridors in Segment 4.			
Wildlife Areas			
There are no Wildlife Areas present in the alternative route study corridors in Segment 4.			

Applicant's Proposed Action Alternative

The 1-mile-wide study corridor for the Applicant's Proposed Action would not cross the Oregon National Historic Trail ACEC.

Variations S4-A1 through S4-A3

The affected environment for these variations is the same as that described for the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

The Oregon National Historic Trail ACEC – Birch Creek and Tub Mountain parcels are within the 1-mile-wide study corridor but is not within the 250 foot right-of-way for the Tub Mountain South Alternative (MV-15). Refer to Table 3-250 for information related to relevant and important values and management prescriptions for this area.

Willow Creek Alternative

The affected environment for the Willow Creek Alternative is the same as that described for the Applicant's Proposed Action Alternative.

SEGMENT 5—MALHEUR

Land Ownership, Utility Corridors, and Parallel Facilities

The study corridors in Segment 5 cross portions of one county in Oregon and include a variety of ownership and management entities, including federal, state, and local land-managing agencies. There are no incorporated cities in the Segment 5 study corridor however many unincorporated communities do exist within the study corridor. Table 3-251, Table 3-252, and Table 3-253 present the affected environment for land ownership, utility corridors, and parallel facilities for the alternatives and route variations in Segment 5.

Table 3-251. Land Ownership within the 1-Mile-Wide Study Corridor for Segment 5—Malheur

Alternative Route	Total Length (miles)	Land Ownership (acres)						
		Bureau of Land Management	Bureau of Reclamation	Tribal	Department of Defense	U.S. Forest Service	State	Private
Applicant's Proposed Action	40.4	18,853	368	0	0	0	0	7,098
Variation S5-A1	*7.4*	*1,887*	*0*	*0*	*0*	*0*	*0*	*3,341*
Variation S5-A2	*7.4*	*4,532*	*0*	*0*	*0*	*0*	*0*	*697*
Variation S5-B1	*2.5*	*1,568*	*144*	*0*	*0*	*0*	*0*	*420*
Variation S5-B2	*2.8*	*1,211*	*67*	*0*	*0*	*0*	*0*	*991*
Malheur S	43.5	24,258	239	0	0	0	0	3,791
Malheur A	43.1	23,643	594	0	0	0	0	3,764

The SEORMP corridor and the West-Wide Energy Corridor exist in the study corridors for Segment 5. Table 3-252 presents the findings for designated utility corridors in the study corridors for the alternatives and route variations in Segment 5.

Table 3-252. Utility Corridors within the 1-Mile-Wide Study Corridor for Segment 5—Malheur

Alternative Route	Length (miles)	Resource Management Plan Corridor	West-Wide Energy Corridor
Applicant's Proposed Action	40.4	SEORMP Corridor	Multimodal, designated 1500 foot width
Variation S5-A1	*7.4*	*None present*	*None present*
Variation S5-A2	*7.4*	*None present*	*None present*
Variation S5-B1	*2.5*	*SEORMP Corridor*	*None present*
Variation S5-B2	*2.8*	*SEORMP Corridor*	*None present*
Malheur S	43.5	SEORMP Corridor	Multimodal, designated 1500 foot width
Malheur A	43.1	SEORMP Corridor	Multimodal, designated 1500 foot width

Existing linear energy-related facilities in the study corridors include transmission lines and pipelines. Table 3-253 provides a description of the major transmission line rights-of-way (69-kV and greater) relevant to the study corridors in Segment 5. As noted, pipelines also are considered an existing linear facility, and are included in the analysis of linear facilities. However the available data for this analysis are not refined enough to report by name, diameter, and owner. Refer to MV-12 for general information regarding utility corridor location.

Table 3-253. Parallel Facilities within the 1-Mile-Wide Study Corridor for Segment 5—Malheur

Alternative Route	Total Length (miles)	Transmission Lines		
		Name	Voltage (kilovolt)	Owner
Applicant's Proposed Action	40.4	Unknown Existing H-frame Burns to Midpoint	69 115 500	IPC Unknown IOU
Variation S5-A1	*7.4*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-A2	*7.4*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-B1	*2.5*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-B2	*2.8*	*Not applicable*	*Not applicable*	*Not applicable*
Malheur S	43.5	Unknown Existing H-frame Burns to Midpoint	69 115 500	IPC Unknown IOU
Malheur A	43.1	Unknown Existing H-frame Burns to Midpoint	69 115 500	IPC Unknown IOU

Table Notes:
IPC = Idaho Power Company
IOU = Investor Owner Utility

Applicant's Proposed Action Alternative

The land ownership within the study corridor for the Applicant's Proposed Action Alternative, Variation S5-A1, Variation S5-B2, Malheur S Alternative and Malheur A Alternative is predominately BLM and private.

The land ownership within the study corridor for Variation S5-A2 and Variation S5-B1 is predominately BLM.

Existing Land Use

Segment 5 begins south of Jamieson in Malheur County and ends 3 miles west of the Oregon-Idaho Border. Table 3-254 presents acreages of existing land uses within the 1-mile-wide study corridor of the alternatives and route variations in Segment 5.

Table 3-254. Existing Land Use within the 1-Mile-Wide Study Corridor for Segment 5—Malheur

Alternative Route	Total Acres	Existing Land Use (acres)					
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland
Applicant's Proposed Action	26,294	517	5,178	56	79	7,788	12,676
Variation S5-A1	*5,228*	*68*	*480*	*0*	*0*	*3,086*	*1,594*
Variation S5-A2	*5,229*	*2*	*777*	*0*	*0*	*2,470*	*1,980*
Variation S5-B1	*2,126*	*244*	*244*	*26*	*23*	*275*	*1,315*
Variation S5-B2	*2,254*	*628*	*196*	*52*	*14*	*197*	*1,167*
Malheur S	28,257	128	5,793	47	76	7,137	15,076
Malheur A	27,963	112	5,489	62	84	6,660	15,556

Table Notes: This data is based on U.S. Geological Service GAP data.

Table 3-255 presents existing structures within the 1-mile-wide study corridor of the alternatives and route variations in Segment 5.

Table 3-255. Existing Land Use Structures Crossed By or Adjacent to Alternatives and Route Variations in Segment 5—Malheur

Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	1 extraction-mining	0	1 other 3 outstructures	1 flood control facility 1 other	1 extraction-mining 1 other 12 outstructures 2 residential
Variation S5-A1	*0*	*0*	*1 outstructure*	*1 other*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*

Table 3-255. Existing Land Use Structures Crossed By or Adjacent to Alternatives and Route Variations in Segment 5—Malheur					
Alternative Route	**Crossed by the Reference Centerline**	**Within the Right-of-way**	**Distance from Reference Centerline**		
			0.125-mile	**0.126 to 0.25-mile**	**0.26 to 0.5-mile**
Variation S5-B1	*0*	*0*	*0*	*0*	*7 outstructures* *1 residential*
Variation S5-B2	*0*	*0*	*2 outstructures*	*6 outstructures* *2 residential*	*1 building (non-residence)* *1 outstructure* *1 residential*
Malheur S	0	0	1 other 1 outstructure	1 building (non-residence) 1 flood control facility 2 outstructures 1 residential	1 other 2 outstructures
Malheur A	0	1 outstructure	1 campground facility 1 other 7 outstructures	1 flood control facility 1 residential	1 other 4 outstructures

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative in Segment 5 crosses unincorporated portions of Malheur County in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed primarily of shrubland, grassland, bare ground, cliffs and talus slopes. Small concentrations of agriculture and farming land uses occur where this alternative crosses the Malheur and Owyhee rivers. The 1-mile-wide study corridor for this alternative crosses approximately 517 acres (or 2 percent) of lands associated with agricultural production and approximately 56 acres (less than 1 percent) of developed lands (Table 3-254). The remaining 25,721 acres (or 98 percent) in this study corridor are primarily undeveloped shrublands, grasslands, bare ground, cliffs and talus slopes. Approximately 23 structures, including 2 residences, occur within 0.5 mile of the reference centerline of this alternative, and a structure associated with mining is crossed by the reference centerline (Table 3-255).

Variation S5-A1

Variation S5-A1 is approximately 7.4 miles long, and is located along Link 5-15 of the Applicant's Proposed Action Alternative. The existing land use within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed of grassland, shrubland, and bare ground, cliffs and talus slopes. This variation crosses scattered agricultural fields approximately 8.9 miles southwest of the City of Vale. Approximately two structures are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S5-A2

The existing land uses located within the study corridor for Variation S5-A2 are similar to those described for Variation S5-A1 except it avoids the agricultural fields southwest of the City of Vale.

Variation S5-B1

Variation S5-B1 is approximately 2.6 miles long, and is located along Links 5-50, 5-55, 5-65 of the Applicant's Proposed Action Alternative. The existing land use within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed primarily of grassland, shrubland, and bare ground, cliffs and talus slopes. This variation crosses near a concentration of agricultural fields and rural residences approximately 4.9 miles west of the City of Adrian. Approximately eight structures, including one residence, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S5-B2

The existing land uses located within the study corridor for Variation S5-B2 are similar to those described for Variation S5-B1. Approximately 13 structures, including 3 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Malheur S Alternative

The Malheur S Alternative in Segment 5 crosses unincorporated portions of Malheur County in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed primarily of shrubland, grassland, bare ground, cliffs and talus slopes. A small concentration of agriculture and farming land uses occur where this alternative crosses Malheur River. The 1-mile-wide study corridor for this alternative crosses approximately 128 acres (less than one percent) of lands associated with agricultural production and approximately 47 acres (less than 1 percent) of developed lands (Table 3-254). The remaining 28,082 acres (or 99 percent) in this study corridor are primarily undeveloped shrublands, grasslands, bare ground, cliffs and talus slopes. Approximately 10 structures, including 1 residence, occur within 0.5 mile of the reference centerline of this alternative, and no structures are located within the proposed right-of-way or are crossed by the reference centerline (Table 3-255).

Malheur A Alternative

The Malheur A Alternative in Segment 5 crosses unincorporated portions of Malheur County in Oregon. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed primarily of shrubland, grassland, bare ground, cliffs and talus slopes. A small concentration of agriculture and farming land uses occur where this alternative crosses Malheur River. The 1-mile-wide study corridor for this alternative crosses approximately 112 acres (less than one percent) of lands associated with agricultural production and approximately 62 acres (less than 1 percent) of developed lands (Table 3-254). The remaining 27,790 acres (or 99 percent) in this study corridor are primarily undeveloped shrublands, grasslands, bare ground, cliffs and talus slopes.

Approximately 17 structures, including 1 residence, occur within 0.5 mile of the reference centerline of this alternative, and one outstructure is located within the proposed right-of-way. No structures in this alternative are crossed by the reference centerline (Table 3-255).

Timber Management

No forested vegetation, and, thus, no timber resources, are present on any alternative route or variation in Segment 5.

Fire Management

This section presents information on recent fire history, using available data dating from 2000 through 2015. All other aspects of the affected environment for fire management are considered to be common to all alternatives. Refer to Section 3.2.3 for additional information on fire ecology.

Applicant's Proposed Action Alternative

In Segment 5, the Applicant's Proposed Action Alternative crosses areas affected by several historical fires, including a number of relatively small fires. Larger previously burned areas crossed in Segment 5 include the 2000 Wildhorse Spring Fire (1,874 acres), the 2011 Vines Hill Fire (1,226 acres), the 2005 Double Mountain Fire (22,112 acres), and the 2013 Owyhee Fire 46,511 acres).

Variations S5-A1 and S5-A2

These variations cross the area affected by the 2005 Double Mountain Fire (22,112 acres).

Variations S5-B1 and S5-B2

No recently burned areas are crossed by these variations.

Malheur S Alternative

The Malheur S Alternative crosses areas affected by the same fires as the Applicant's Proposed Action Alternative, but in different locations for the areas affected by the Double Mountain and Owyhee fires.

Malheur A Alternative

The Malheur A Alternative crosses areas affected by the same fires as the Applicant's Proposed Action Alternative, but in different locations for the areas affected by the Double Mountain and Owyhee fires.

Zoning

The following is an inventory of the generalized zoning classifications for each alternative and route variation in Segment 5. Refer to Section 3.2.6.4 for a description of the generalized zoning types, and MV-14 for their locations.

Applicant's Proposed Action Alternative

Approximately 95 percent of the Applicant's Proposed Action Alternative crosses lands zoned for Grazing and approximately 5 percent zoned for Agriculture.

Variation S5-A1

Approximately 81 percent of the Variation S5-A1 crosses lands zoned for Grazing and approximately 19 percent zoned for Agriculture.

Variations S5-A2 and S5-B2

Approximately 100 percent of Variations S5-A2 and S5-B2 cross lands zoned for Grazing.

Variation S5-B2

Approximately 50 percent of the Variation S5-B2 crosses lands zoned for Grazing and approximately 50 percent zoned for Agriculture.

Malheur S Alternative

Approximately 99 percent of the Malheur S Alternative crosses lands zoned for Grazing and approximately 1 percent zoned for Agriculture.

Malheur A Alternative

Approximately 99 percent of the Malheur A Alternative crosses lands zoned for Grazing and approximately 1 percent zoned for Agriculture.

Military Training

Table 3-256 presents the affected environment for military training in special-use airspace for the alternatives and route variations in Segment 5.

Table 3-256. Military Training within the 1-Mile-Wide Study Corridor for Segment 5—Malheur

Alternative Route	Total Length (miles)	Military Training Routes (miles crossed)
Applicant's Proposed Action	40.4	37.9
Variation S5-A1	*7.4*	*7.4*
Variation S5-A2	*7.4*	*7.4*
Variation S5-B1	*2.5*	*2.5*
Variation S5-B2	*2.8*	*2.8*
Malheur S	43.5	26.5
Malheur A	43.1	26.1

Applicant's Proposed Action Alternative

The Applicant's Proposed Action crosses through training routes within special-use airspace. Military training routes are aerial corridors within special-use airspace used solely by military aviation for training flights. The routes are the result of a joint venture between the FAA and the DoD to provide for high-speed, low-level military activities. Military training routes are divided in to instrument routes, and visual routes. Unless noted on the air navigation chart, aircraft may fly as low as 100 to 110 feet above ground level in the B2H Project area along these routes. Special-use airspace in Segment 5 is used by Navy and other military organizations and is not limited to NWSTF Boardman operations. Map 3-3 shows the location of MTRs in the B2H Project area.

Variation S5-A1

Variation S5-A1 crosses through crosses through training routes within special-use airspace. Therefore, the existing environment pertaining to military training in special-use airspace would be the same as the Applicant's Proposed Action Alternative.

Variation S5-A2

Variation S5-A2 crosses through crosses through training routes within special-use airspace. Therefore, the existing environment pertaining to military training in special-use airspace would be the same as the Applicant's Proposed Action Alternative.

Variation S5-B1

Variation S5-B1 crosses through crosses through training routes within special-use airspace. Therefore, the existing environment pertaining to military training in special-use airspace would be the same as the Applicant's Proposed Action Alternative.

Variation S5-B2

Variation S5-B2 crosses through crosses through training routes within special-use airspace. Therefore, the existing environment pertaining to military training in special-use airspace would be the same as the Applicant's Proposed Action Alternative.

Malheur S Alternative

The Malheur S Alternative crosses through training routes within special-use airspace. Therefore, the existing environment pertaining to military training in special-use airspace would slightly less (9 miles) but similar to the Applicant's Proposed Action Alternative.

Malheur A Alternative

The Malheur A Alternative crosses through MTRs associated with NWSTF Boardman and other military. Therefore, the existing environment pertaining to military training in special-use airspace would be slightly less (9 miles) but similar to the Applicant's Proposed Action Alternative.

Specially Designated Areas

Specially designated areas are lands managed by federal or state agencies to protect values and land uses unique to an area. These areas typically require more intensive management emphasis than is applied to surrounding public lands. Specially designated areas are administratively designated. Administrative designations present in the B2H Project area are ACECs and RNAs. Other types of specially designated areas present in the B2H Project area include designations administered and managed by state natural resource and wildlife departments. These entities include missions to protect habitat, provide recreation and educational opportunities. These include Wildlife Areas.

Potential Congressional designations are described in Section 3.2.11; lands with wilderness characteristics are described in Section 3.2.10.

Area of Critical Environmental Concern

The BLM designates ACECs where special management attention is needed to protect, and prevent irreparable damage to, important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes to protect human life and safety from natural hazards (BLM 1988). The Owyhee River Below the Dam ACEC is located within the 1-mile analysis area, but is not within the 250 foot right-of-way.

Research Natural Areas

There are no RNAs present in the alternative route study corridors in Segment 5.

Wildlife Areas

There are no Wildlife Areas present in the alternative route study corridors in Segment 5.

Table 3-257 presents the specially designated areas and their relevant and important values and management prescriptions for the alternatives and route variations in Segment 5.

Table 3-257. Specially Designated Areas within the 1-Mile-Wide Study Corridor for Segment 5—Malheur

Relevant and Important Values	Management Prescriptions Relevant to Utility Rights-of-Way	Relevant Alternative Routes
Areas of Critical Environmental Concern		
Owyhee River Below the Dam Area of Critical Environmental Concern		
High scenic values of diverse landscape elements in a substantially natural setting, a special status plant species (Mulford's milkvetch), the rare presence of a black cottonwood gallery in a riverine system, and the combined wildlife values of diverse habitat types supporting a large number of wildlife species and important migratory corridor for neotropical birds.	Avoidance area for rights-of-way; granting rights-of-way (surface) within area should be avoided, but rights-of-way may be granted if there is minimal conflict with identified resource values and impacts can be mitigated.	• Applicant's Proposed Action • Variations S5-B1 and S5-B2 • Malheur S Alternative • Malheur A Alternative
Research Natural Areas		
There are no Research Natural Areas present in the alternative route study corridors in Segment 5.		
Wildlife Areas		
There are no Wildlife Areas present in the alternative route study corridors in Segment 5.		

Applicant's Proposed Action Alternative

The Owyhee River Below the Dam ACEC is within the 1-mile-wide study corridor, but is not within the 250 foot right-of-way, for the Applicant's Proposed Action Alternative. Refer to Table 3-257for information related to relevant and important values and management prescriptions for this area.

Variations S5-A1 and S5-A2

The 1-mile-wide study corridor for these variations would not cross the Owyhee River Below the Dam ACEC.

Variations S5-B1 and S5-B2

The affected environment for these variations is the same as that described for the Applicant's Proposed Action Alternative.

Malheur S Alternative

The Owyhee River Below the Dam ACEC is within the 1-mile wide study corridor and the 250 foot right-of -way for the Malheur S Alternative(Link 5-30).

Malheur A Alternative

The Owyhee River Below the Dam ACEC is within the 1-mile wide study corridor and the 250 foot right-of-way for the Malheur A Alternative (Link 5-35).

SEGMENT 6—TREASURE VALLEY

Land Ownership, Utility Corridors, and Parallel Facilities

The study corridors in Segment 6 cross portions of one county in Oregon and one county in Idaho including a variety of ownership and management entities (i.e., federal, state, and local land-managing agencies). There are no incorporated cities in the Segment 6 study corridor however many unincorporated communities do exist within the study corridor. Table 3-258, Table 3-259, and Table 3-260 presents the affected environment for land ownership, utility corridors, and parallel facilities for the alternatives and route variations in Segment 6.

Table 3-258. Land Ownership within the 1-Mile-Wide Study Corridor for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Land Ownership (acres)						
		Bureau of Land Management	Bureau of Reclamation	Tribal	Department of Defense	U.S. Forest Service	State	Private
Applicant's Proposed Action	28.0	13,678	59	0	0	0	1,766	2,860
Variation S6-A1	*9.3*	*5,116*	*34*	*0*	*0*	*0*	*128*	*1,177*
Variation S6-A2	*8.9*	*3,916*	*72*	*0*	*0*	*0*	*232*	*1,971*
Variation S6-B1	*14.4*	*7,138*	*0*	*0*	*0*	*0*	*1,638*	*913*
Variation S6-B2	*14.1*	*7,077*	*0*	*0*	*0*	*0*	*1,860*	*579*

Both RMP corridors and utility corridor exist in the study corridors for Segment 6. Table 3-259 presents the findings for designated utility corridors in the study corridors for the alternatives and route variations in Segment 6.

Table 3-259. Utility Corridors within the 1-Mile-Wide Study Corridor for Segment 6—Treasure Valley			
Alternative Route	**Length (miles)**	**Resource Management Plan Corridor**	**West-Wide Energy Corridor**
Applicant's Proposed Action	28.0	Approved Resource Management Plan (RMP) Amendments/Record of Decision (ROD) for Designation of Energy Corridors on Bureau of Land Management (BLM) Administered Lands	Multimodal, designated, 3,000 foot width
Variation S6-A1	*9.3*	*Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM Administered Lands*	*Multimodal, designated, 3,000 foot width*
Variation S6-A2	*8.9*	*Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM Administered Lands*	*Multimodal, designated, 3,000 foot width*
Variation S6-B1	*14.4*	*Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM Administered Lands*	*Multimodal, designated, 3,000 foot width*
Variation S6-B2	*14.1*	*Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM Administered Lands*	*Multimodal, designated, 3,000 foot width*

Existing linear energy-related facilities in the study corridors include transmission lines and pipelines. Table 3-260 provides a description of the major transmission line rights-of-way (69-kV and greater) relevant to the study corridors in Segment 6. As noted, pipelines also are considered an existing linear facility, and are included in the analysis of linear facilities. However, the available data for this analysis are not refined enough to report by name, diameter, and owner. Refer to MV-12 for general information regarding utility corridor locations.

Table 3-260. Parallel Facilities within the 1-Mile-Wide Study Corridor for Segment 6—Treasure Valley				
Alternative Route	**Total Length (miles)**	**Transmission Line**		
		Name	**Voltage (kilovolt)**	**Owner**
Applicant's Proposed Action	28.0	Unknown Unknown Unknown Burns to Midpoint	69 230 500 500	IPC IPC IPC IOU
Variation S6-A1	*9.3*	*Burns to Midpoint*	*500*	*IOU*
Variation S6-A2	*8.9*	*Burns to Midpoint*	*500*	*IOU*
Variation S6-B1	*14.4*	*Unknown* *Burns to Midpoint*	*69* *500*	*IPC* *IOU*
Variation S6-B2	*14.1*	*Unknown* *Burns to Midpoint*	*69* *500*	*IPC* *IOU*

Table Notes:
IOU = Investor Owner Utility
IPC = Idaho Power Company

Applicant's Proposed Action Alternative

The land ownership within the study corridor for the Applicant's Proposed Action is predominately BLM.

The land ownership within the study corridor for Variation S6-A1 and Variation S6-A2 is predominately BLM and private. The land ownership within the study corridor for Variation S6-B1 and Variation S6-B2 is predominately BLM and state.

Existing Land Use

Segment 5 begins 3 miles west of the Oregon-Idaho Border and ends at the Hemingway Substation in Owyhee County, Idaho. Table 3-261 presents acreages of existing land uses within the 1-mile-wide study corridor of the alternatives and route variations in Segment 6.

Table 3-261. Existing Land Use within the 1-Mile-Wide Study Corridor for Segment 6—Treasure Valley

Alternative Route	Total Acres	Existing Land Use (acres)					
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland
Applicant's Proposed Action	18,359	410	605	159	92	7,451	9,642
Variation S6-A1	*6,455*	*38*	*34*	*9*	*8*	*3,397*	*2,969*
Variation S6-A2	*6,191*	*241*	*32*	*47*	*13*	*2,737*	*3,120*
Variation S6-B1	*9,685*	*202*	*455*	*100*	*45*	*3,261*	*5,623*
Variation S6-B2	*9,517*	*86*	*788*	*100*	*43*	*2,737*	*5,763*

Table Notes: This data is based on U.S. Geological Service GAP data.

Table 3-262 presents existing structures within the 1-mile-wide study corridor of the alternatives and route variations in Segment 6.

Table 3-262. Existing Land Use Structures Crossed By or Adjacent to Alternatives and Route Variations in Segment 6—Treasure Valley

Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	2 buildings (non-residence) 1 extraction-mining 3 outstructures	1 cemetery 1 extraction-mining 5 outstructures 2 residential	7 buildings (non-residence) 1 extraction-mining 14 outstructures 9 residential
Variation S6-A1	*0*	*0*	*1 outstructure*	*1 residential*	*1 building (non-residence)* *1 extraction-mining* *4 outstructures* *2 residential*

Table 3-262. Existing Land Use Structures Crossed By or Adjacent to Alternatives and Route Variations in Segment 6—Treasure Valley					
Alternative Route	Crossed by the Reference Centerline	Within the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Variation S6-A2	*1 building (non-residence)* *2 outstructures*	*0*	*1 extraction-mining* *1 outstructure* *1 residential*	*0*	*3 buildings (non-residence)* *13 outstructures* *6 residential*
Variation S6-B1	*0*	*0*	*1 building (non-residence)* *1 extraction-mining*	*1 extraction-mining* *5 outstructures* *1 residential*	*6 buildings (non-residence)* *8 outstructures* *2 residential*
Variation S6-B2	*0*	*0*	*5 outstructures* *1 residential*	*1 extraction-mining*	*2 buildings (non-residence)* *4 outstructures* *2 residential*

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative in Segment 6 crosses unincorporated portions of Malheur County in Oregon and Owyhee County in Idaho. Existing land uses within the study corridor can generally be characterized as vacant undeveloped areas composed primarily of shrubland, grassland, bare ground, cliffs and talus slopes. Dense agricultural fields, farms and rural residences are scattered approximately 1 mile north of this alternative as it roughly parallels the Snake River in Owyhee County; however, the 1-mile-wide study corridor for this alternative crosses approximately 410 acres (or 2 percent) of lands associated with agricultural production and approximately 159 acres (or 1 percent) of developed lands (Table 3-261). Land Use within the 1-mile-wide study corridor). The remaining 17,790 acres (or 97 percent) in this study corridor are primarily undeveloped shrublands, grasslands, bare ground, cliffs and talus slopes. Approximately 46 structures, including 11 residences, occur within 0.5 mile of the reference centerline of this alternative. The B2H Project terminates at the Hemingway Substation approximately 1 mile southwest of the unincorporated community of Wilson.

Variation S6-A1

Variation S6-A1 is approximately 9.3 miles long, and is located along Links 6-10 and 6-20 of the Applicant's Proposed Action Alternative for Segment 6. The existing land use within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed of grassland, shrubland, and bare ground, cliffs and talus slopes. Approximately 10 structures, including 3 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S6-A2

The existing land uses located within the study corridor for Variation S6-A2 are similar to those described for Variation S6-A1. However, Variation S6-A2 crosses more agricultural lands, and approximately 28 structures, including 7 residences, are located within 0.5 mile of the reference

centerline of this variation. One non-residential building and two outstructures are crossed by the reference centerline.

Variation S6-B1

Variation S6-B1 is approximately 14.4 miles long, and is located along Link 6-25 of the Applicant's Proposed Action Alternative for Segment 6. The existing land use within the study corridor for this variation can generally be characterized as vacant undeveloped areas composed of shrubland, grassland, and bare ground, cliffs and talus slopes. Approximately 25 structures, including 3 residences, are located within 0.5 mile of the reference centerline of this variation. Along this variation no structures are located within the proposed right-of-way or are crossed by the reference centerline.

Variation S6-B2

The existing land uses located within the study corridor for Variation S6-B2 are similar to those described for Variation S6-B1. However, Variation S6-B2 crosses less agricultural lands, and fewer structures are located within 0.5 mile of the reference centerline.

Timber Management

Table 3-263 presents the affected environment for timber management for the alternatives and route variations in Segment 6. No forested vegetation, and, thus, no timber resources, are present on any alternative route or variation in Segment 6 with one area of exception located along Variation S6-B2.

Table 3-263. Timber Management within the 1-Mile-Wide Study Corridor for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Aspen	Forest-Other	Juniper and Mahogany Woodland	Mixed Conifer Forest	Total
Applicant's Proposed Action	28.0	0.0	0.0	0.0	0.0	0.0
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*0.1*	*0.0*	*0.1*

Applicant's Proposed Action Alternative and Variations S6-A1, S6-A2, S6-B1, and S6-B2

There is no forested vegetation crossed by the Applicant's Proposed Action Alternative or Variations S6-A1, S6-A2, and S6-B1.

Variation S6-B2

Variation S6-B2 crosses 0.1 mile of forested vegetation. This location is not identified as a commercially harvestable timber resource.

Fire Management

This section presents information on recent fire history, using available data dating from 2000 through 2015. All other aspects of the affected environment for fire management are considered to be common to all alternatives. Refer to Section 3.2.3 for additional information on fire ecology.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action in Segment 6 crosses areas affected by the 2015 Soda Fire (283,400 acres). Several smaller fires burned previously in the area affected by the Soda Fire as well.

Variations S6-A1, S6-A2, S6-B1, and S6-B2

These variations cross the previously burned areas discussed under the Applicant's Proposed Action Alternative, but in slightly different locations.

Zoning

The following is an inventory of the generalized zoning classifications for each alternative and route variation in Segment 6. Refer to Section 3.2.6.4 for a description of the generalized zoning types, and MV-14 for their locations.

Applicant's Proposed Action Alternative

Approximately 85 percent of the Applicant's Proposed Action Alternative crosses lands zoned for Agriculture and approximately 15 percent zoned for Grazing.

Variation S6-A1

Approximately 72 percent of the Variation S6-A1 crosses lands zoned for Agriculture and approximately 28 percent zoned for Grazing.

Variation S6-A2

Approximately 80 percent of the Variation S6-A2 crosses lands zoned for Agriculture and approximately 20 percent zoned for Grazing.

Variations S6-B1 and S6-B2

Approximately 100 percent of these variations cross lands zoned for Agriculture.

Military Training

Table 3-264 presents the affected environment for military training in special-use airspace for the alternatives and route variations in Segment 6.

Table 3-264. Military Training within the 1-Mile-Wide Study Corridor for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Military Training Routes (miles)
Applicant's Proposed Action	28.0	1.0
Variation S6-A1	*9.3*	*0.0*
Variation S6-A2	*8.9*	*0.0*
Variation S6-B1	*14.4*	*0.0*
Variation S6-B2	*14.1*	*0.0*

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses one mile of MTRs associated within special-use airspace. Military training routes are aerial corridors used solely by military aviation for training flights. The routes are the result of a joint venture between the FAA and the DoD to provide for high-speed, low-level military activities. Military training routes are divided in to instrument routes, and visual routes. Unless noted on the air navigation chart, aircraft may fly as low as 100 to 110 feet above ground level in the B2H Project area along these routes. Special-use airspace in Segment 6 is used by Navy and other military organizations and is not limited to NWSTF Boardman operations. Map 3-3 shows the location of MTRs in the B2H Project area.

Route variations in Segment 6 do not cross through special-use airspace training areas.

Specially Designated Areas

Specially designated areas are lands managed by federal or state agencies to protect values and land uses unique to an area. These areas typically require more intensive management emphasis than is applied to surrounding public lands. Specially designated areas are administratively designated. Administrative designations present in the B2H Project area are ACECs and RNAs. Other types of specially designated areas present in the B2H Project area include designations administered and managed by state natural resource and wildlife departments. These entities include missions to protect habitat, provide recreation and educational opportunities. These include Wildlife Areas and Herd Management Areas.

Congressionally designated areas are described in Section 3.2.11; lands with wilderness characteristics are described in Section 3.2.10.

Area of Critical Environmental Concern

The BLM designates ACECs where special management attention is needed to protect, and prevent irreparable damage to, important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes to protect human life and safety from natural hazards (BLM 1988). The Jump Creek ACEC is located within the 1-mile analysis area, but is not within the 250 foot right-of-way.

Research Natural Areas

There are no RNAs present in the alternative route study corridors in Segment 6.

Wildlife Areas

There are no Wildlife Areas present in the alternative route study corridors in Segment 6.

Table 3-265 presents the specially designated areas and their relevant and important values and management prescriptions for the alternatives and route variations Segment 6.

Herd Management Areas

The BLM Hard Trigger herd management area is located in Owyhee County, Idaho. The herd management area is maintained by the BLM in accordance with The Wild Free-Roaming Horses and

Burros Act of 1971 (Public Law 92-195). Hard Trigger herd management area includes 66,063 total acres of public and other land within the BLM Owyhee Field Office, and is located south of the Snake River between Murphy and U.S. Highway 95 to the west. Herd management area characteristics include rolling hills and sagebrush steppe. The approved management level for the Hard Trigger herd management area is between 66 and 130 animals.

Table 3-265. Specially Designated Areas within the 1-Mile-Wide Study Corridor for Segment 6—Treasure Valley

Relevant and Important Values	Management Prescriptions Relevant to Utility Rights-of-Way	Relevant Alternative Routes
Areas of Critical Environmental Concern		
Jump Creek Canyon Area of Critical Environmental Concern		
Jump Creek Canyon contains excellent examples of several different undisturbed riparian communities along its perennial stream, a diversity of special status animal and other wildlife species, pockets of excellent condition Wyoming sagebrush-bluebunch wheatgrass, and high scenic values. A small portion of the area is currently designated as a recreation site, and the remainder is within the Jump Creek Special Recreation Management Area. Jump Creek is designated as a Stream Segment of Concern.	Exclusion area for surface rights-of-way. Rights-of-way (surface, subsurface and aerial) will not be granted within this area.	Variation S6-B2
Research Natural Areas		
There are no Research Natural Areas present in the alternative route study corridors in Segment 6.		
Wildlife Areas		
There are no Wildlife Areas present in the alternative route study corridors in Segment 6.		
Hard Trigger Herd Management Area		
Not identified.	Appropriate Management Levels (AMLs) for wild horses within the Hardtrigger herd management area are 66-130	• Applicant's Proposed Action • Variations S6-B1 and S6-B2

Applicant's Proposed Action Alternative

The Hard Trigger herd management area is located within the 250 foot right-of-way for the Applicant's Proposed Action Alternative; refer to Table 3-265 for information regarding relevant and important values. The Jump Creek ACEC is not within the 1 mile analysis area for the Applicant's Proposed Action Alternative (Link 6-20).

Variations S6-A1 and S6-A2

Variation S6-A1 and S6-A2 do not cross the Jump Creek ACEC or the Hard Trigger herd management area.

Variation S6-B1

The affected environment for Variation S6-B1 is the same as that described for the Applicant's Proposed Action Alternative.

Variation S6-B2

The Jump Creek Canyon ACEC is within the 1-mile-wide analysis area, is not within the 250 foot wide right-of-way for this variation (Link 6-20). Similar to the Applicant's Proposed Action Alternative, the Hard Trigger herd management area is located within the 250 right-of-way for Variation S6-B2. Refer to Table 3-265 for information related to relevant and important values and management prescriptions for this area.

3.2.6.6 Environmental Consequences (Results of Analysis)

This section generally describes the environmental consequences of the B2H Project on land uses and agriculture. It begins with a review of the criteria that were used to determine impact intensity levels, which is followed by a summary of the design features of the B2H Project for environmental protection that would be applied and that were utilized in the identification of impacts. This is followed by a description of the effects unique to each B2H Project alternative.

Types of Potential Effects

The construction, operation, and maintenance of the B2H Project potentially would result in both direct and indirect effects on land uses. The types of potential effects are described in this section.

Land Ownership, Utility Corridors, Parallel Facilities

Potential effects related to land use and land ownership include the short- or long-term limitations on the use of property. Short-term effects could include temporary constraints on access to a property during construction that cease once the construction activities are completed. Long-term effects could include change of access to a property or use of a property for placement of B2H Project infrastructure. Minimizing impacts on private property and property rights would be carefully considered by the Applicant during final design and engineering (e.g., micro-siting structure placement). The Applicant would negotiate with the owners of real property interests to ensure that, if any private property interests are impaired by the final location, they are appropriately compensated. Other types of potential impacts are discussed in other EIS sections, including Section 3.2.16, Section 3.2.17, and Section 3.2.18.

Existing Land Use

Potential direct and indirect effects on existing land uses could result from the construction and operation of the B2H Project. Potential temporary direct effects from construction activities that could

affect existing residential commercial, industrial and agricultural land uses include detouring of roads, removal of fencing, or non-intentional damage to property. In some cases, access to existing commercial or agricultural operations may be periodically hindered in areas where public and employee access is prohibited for safety reasons.

Potential long-term effects on existing land uses could include restrictions of access or use on lands within the B2H Project study corridor, including restrictions on erection or placement of any building or structure not associated with transmission line facilities; the storage of flammable material; or restrictions on equipment or vehicles into the right-of-way that exceed 14 feet in height. The right-of-way would continue to be used for roads and other general purposes consistent with these limitations. Special access provisions in mining areas could be negotiated with the landowner to maintain existing practices.

Additional potential long-term effects could include physical conflicts with existing residential, commercial, industrial, agricultural or public facilities. B2H Project facilities, including structures, access roads, and substations, could permanently displace some current land uses within the right-of-way, but the transmission line would be located so as to minimize long-term disruptions of current land uses.

Long-term indirect effects could include the potential for colocation of future utilities with the B2H Project. This potential for colocation of future utilities would depend on the regional need for additional facilities, future decisions by the cities' and counties' planning and zoning authorities, and processes in the B2H Project study area.

Timber Management

Potential direct and indirect impacts on timber management may result from construction and operation of the B2H Project. Construction of the B2H Project would require clearing of forested lands in the Wallowa-Whitman National Forest, on forested lands managed by the BLM and Oregon, and on private lands. Refer to Section 3.2.16 for additional information on the potential socioeconomic impacts of timber removal. Refer to Section 3.2.7 for potential impacts on tree farm operations.

Construction through timber management areas and other forested lands would require the removal of trees within the right-of-way and hazard trees adjacent to the right-of-way and adjacent hazard trees that could fall into transmission structures and access roads. Removal of trees within the transmission line right-of-way would be a long-term impact, persisting for the life of the B2H Project. Removal of trees for staging areas, pulling and tensioning sites, and other areas that would be reclaimed following construction would be a long-term impact. The merchantable value of the timber would be determined and the landowner or land-managing agencies would be compensated at fair market value for the timber needing to be removed through authorization by a forest product sale, contract, permit or federal law or regulation.

Potential impacts related to operation of the B2H Project would be long-term, but would not persist beyond the life of the B2H Project. The presence of transmission line structures and conductors could interfere with aerial logging operations, such as helicopter or skyline logging. Vegetation management

will require the occasional removal of young trees in the right-of-way, preventing regrowth of timber. Both authorized and unauthorized vehicular traffic on access roads used for the maintenance and operations of a new transmission line may increase the risk of wildland fire, potentially damaging or destroying existing timber resources outside the B2H Project right-of-way. Tree growth pattern changes in response to wind loading, and trees in dense forests may be susceptible to windthrow if nearby trees are removed (Hale et al. 2012), such as where the right-of-way would cross a currently forested area.

Fire Management

The potential impacts on fire management include the following:

- Activities related to construction and operation of the B2H Project could result in accidental fire ignitions.
- Increased public access along newly created access roads would increase the area where human-caused ignitions could occur.
- Fire-suppression activities may be constrained for safety near the B2H Project, particularly aerial operations and certain types of ground operations where a potential electrical hazard (e.g., downed power lines or other hazards) would exist.
- Fire management may benefit from increased access or the ability to use the right-of-way to develop fire breaks in some cases.
- Fire management opportunities related to prescribed fire or wildland fire use would be constrained near the B2H Project.
- Alteration in vegetation cover as a result of ground-disturbing activities and reclamation may alter the fire regime, potentially resulting in conditions not desired for fire management.

Zoning

Types of Potential Effects related to Zoning include limitations on development as-of-right, need for an amendment, or conditional-use permit for construction in areas that development was previously permitted. For example, all agricultural lands zoned for EFU within Oregon counties would require the Applicant to demonstrate necessity before a permit would be issued to cross EFU-zoned land (refer to Section 3.2.6.2).

Military Training

Some alternative routes cross through NWSTF Boardman Special-use Airspace and other military special-use airspace training routes. Short-term impacts during the construction of B2H Project infrastructure would include the potential for large construction equipment to interfere with NWSTF Boardman Special-use Airspace and other military special-use airspace operations. Long-term effects from the B2H Project would result from the presence of transmission line structures and conductors located within the training route pathways. The presence of these structures could create potential hazards during military training activities.

In addition, historic use of NWSTF Boardman has resulted in the presence of unexploded ordnance on the property. Ground-disturbing activities associated with the construction, operation, and maintenance of the B2H Project could result in a risk to the public in areas where unexploded ordinance clearance has not been confirmed.

Specially Designated Areas

The construction, operation, and maintenance of the B2H Project potentially would result in both direct and indirect effects on specially designated areas. Direct effects may include conflicts with management prescriptions during construction of the B2H Project, conflicts associated with the presence of the transmission line with management prescriptions, and vegetation management of the transmission line right-of-way. Indirect effects may include potential degradation of a specially designated area due to increased access. The ability to manage the specially designated area during, but more importantly, after construction of the B2H Project would be the primary effect being considered for this analysis.

NO ACTION ALTERNATIVE

If the No Action Alternative is selected, land uses in the B2H Project area, including agricultural operations, would continue unaffected by the B2H Project. Changes in land use are expected over time, but none would be created by the proposed B2H Project.

EFFECTS COMMON TO ALL ALTERNATIVES

Fire Management

While fire behavior can be very generally predicted through vegetation conditions, the actual behavior of a fire depends considerably on the weather conditions at the time of the fire ignition. Additionally, fire ignitions cannot be predicted, although conditions with a high risk of fire ignition and spread can be identified in short-term weather forecasts. Ignitions from natural causes, or from accidental or intentional human causes not related to the B2H Project, cannot be predicted or prevented. With consideration of these issues, a discussion of impacts on fire management specific to any alternative route is not feasible.

State law in Oregon and Idaho requires that basic fire prevention and suppression equipment is available during construction activities in flammable vegetation, and activities that may cause fire ignitions can be prohibited during weather conditions with a high fire risk. Design Feature 1 of the B2H Project for environmental protection provides that a Fire Protection Plan would be included as a part of the POD, and would be enforced through monitoring. Design Feature 23 of the B2H Project for environmental protection prohibits open burning of trash related to construction and operation of the B2H Project. Design Feature 24 of the B2H Project for environmental protection (Table 2-7) requires spark arrestors on all engines used in construction and operation of the B2H Project.

The operation of the B2H Project could influence fire management in the following ways:

- The use of construction and maintenance equipment in the right-of-way could cause fire ignitions.
- The transmission line could cause fire ignitions from contact with encroaching vegetation, failure of components (e.g., downed power lines), airplanes striking a line and starting a fire on hitting the ground, sparking at substations and transformers, or electricity arcing to the ground during smoky or humid conditions.
- New access roads can increase the area where accidental or intentional human-caused fire ignitions may occur.
- Increased public access could lead to increased numbers of human-caused fires.
- The B2H Project transmission line and other facilities such as staging areas would require protection from fire.
- The presence of transmission structures and conductors could affect aerial suppression or fuel reductions operations, such as those using helicopters, single-engine air tankers, air tactical aircraft, utility aircraft, aerial supervision modules, heavy air tankers, smokejumper aircraft, and large transport aircraft.
- The presence of the transmission line could delay firefighters from work near the right-of-way while they wait for the line to be de-energized for safety.
- Changes in vegetation in the B2H Project right-of-way, through vegetation removal and postconstruction reclamation, can alter fire behavior.

Human activity associated with construction and maintenance of the B2H Project or vegetation encroachment into the right-of-way during the life of the B2H Project could increase the potential for fires along the right-of-way, particularly during summertime red-flag warnings (a warning of dangerous fire conditions with low humidity, low fuel moisture and high winds) (BLM 2005). The B2H Project right-of-way would become a high priority for fire suppression and fuels management where it traverses undeveloped areas. Construction facilities where equipment and materials are stored and construction areas where people work are likely to be designated as high-value areas that need protection from wildland fire where they may have been a lower priority otherwise. These additional areas of high-value place an increased demand on fire-suppression personnel and equipment, particularly when other fires require attention.

The B2H Project structures and ancillary facilities could narrow the range of suppression techniques used on wildfires in the right-of-way vicinity, due to the safety hazard that electrical infrastructure represents to firefighters and the potential for damage to the infrastructure in the right-of-way. Aerial operations would become inappropriate near the right-of-way because these operations could endanger pilots and firefighters, and potentially cause damage to the infrastructure in the right-of-way. Aerial application of flame retardants, for example, could require that insulators be manually cleaned prior to reenergizing the transmission line.

Motor-vehicle traffic mobilizing into and out of the right-of-way, if a fire occurs during construction or maintenance, could increase emergency response times if fire crews encounter construction or maintenance traffic when traveling to an incident. There would be low potential for fire responders to encounter traffic associated with right-of-way construction on low-capacity roads. Traffic bottlenecks would not be expected to affect firefighter safety or fire size unless responders encounter convoys of ingress/egress traffic on low-capacity roads. Firefighter access to an area also could be delayed if the transmission line is energized and poses a threat to firefighter safety. Firefighters would have to wait until the line can be de-energized prior to engaging in certain activities near the right-of-way. However, access roads for the B2H Project would provide increased access for fire-suppression personnel, and serve as potential locations to develop firebreaks.

Prescribed fire would be limited as a management tool in the vicinity of the B2H Project right-of-way for many of the same reasons relating to safety and constraints on suppression techniques. This would reduce opportunities to reintroduce fire into ecosystems adjacent to the alternatives and route variations, but the overall reduction would be low because fire is not desirable as a management tool in a majority of areas due to existing resource conditions, mix of land ownership, and structures. No lands in the study corridor are currently designated as a wildland fire use area, where wildland fires might be allowed to burn if resource management objectives would be advanced by the fire. Prescribed fire may be used throughout public lands to meet resource management objectives, particularly vegetation management.

In forested environments, broadcast burning may become an inappropriate tool to dispose of slash in the vicinity of the right-of-way. Clearing trees and large brush and treating weeds within the proposed right-of-way would decrease the continuity of ladder fuels, and could increase the fire-free interval in the vicinity of the proposed right-of-way (Deanne et al. 1998).

Zoning

Impacts from the construction and operation of the B2H Project to zoning are described in terms of the compatibility of the B2H Project with the policies and objectives identified in the local comprehensive plans, as well as, the B2H Project's potential to conform to local zoning codes. Goals and objectives have been identified through local and county comprehensive plans throughout the B2H Project area that identify the desired patterns of land development. The B2H Project study corridors do not cross any zones that exclude or prohibit outright the construction of the B2H Project facilities; however, certain zones the B2H Project crosses would not be permitted for development as-of-right, and would require an amendment, or conditional-use permit for construction. Specific areas are discussed qualitatively on a case-by-case basis. As indicated in Section 3.2.6.3, the Applicant has elected to have the ESFC determine the B2H Project's conformance with local plans and ordinances within Oregon. Owyhee County will determine conformance in Idaho.

Potential conflicts between the B2H Project and local city and county comprehensive plans and zoning ordinances are typically a matter of local physical conditions. In general, these conflicts are due to the potential interference of B2H Project facilities with rural residential and commercial agricultural,

ranching or forestry related land uses. For example, as identified in the 2014 Umatilla County Comprehensive Plan, "Umatilla County agriculture contributes about 100 million dollars in annual income to the county and supports local food processing, transportation, trade, and service employment and payrolls…[b]esides being the largest industry in the county and the second largest industry in Oregon, agriculture creates a rural atmosphere greatly desired by many city, rural, and regional people" (Umatilla County 2014). Similarly, agriculture is a major source of income for private landowners and provides benefits to cities, towns, and counties throughout the B2H Project area (refer to Section 3.2.17). As discussed in Section 3.2.6.2 (Regulatory Framework) preservation of this agricultural heritage is identified as an Oregon Statewide Planning Goal, and is codified by the EFU zones in all Oregon counties crossed by the B2H Project Alternatives. ERU zones are identified in the 1982 Malheur County Comprehensive Plan and 2015 Malheur County Code, and carry the same conditions as the EFU zones. For a discussion of effects on agricultural and rangeland resources, refer to Section 3.2.7.

SEGMENT 1—MORROW-UMATILLA

Land Ownership, Utility Corridors, and Parallel Facilities

Table 3-266 and Table 3-267 present the miles of land ownership and utility corridors crossed for the alternatives and route variations in Segment 1.

Table 3-266. Land Ownership and Utility Corridors for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Land Ownership						Utility Corridors		
		Bureau of Land Management	Bureau of Reclamation	Department of Defense	U.S. Forest Service	State	Private	Resource Management Plan	West-Wide Energy Corridor	Percent within Utility Corridor
Applicant's Proposed Action	91.9	0.1	0.0	10.6	4.5	0.0	76.7	4.2	0.0	4.6
Variation S1-B1	*6.4*	*0.1*	*0.0*	*0.0*	*4.5*	*0.0*	*1.8*	*4.2*	*0.0*	*65.6*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*3.7*	*0.0*	*2.7*	*3.7*	*0.0*	*57.8*
East of Bombing Range Road	92.2	0.1	0.0	0.0	4.5	2.0	85.7	4.2	0.0	4.6
Applicant's Proposed Action – Southern Route	99.2	0.2	0.0	10.6	4.5	0.0	83.8	4.2	0.0	4.2
West of Bombing Range Road – Southern Route	95.6	0.4	0.0	10.6	4.5	0.0	80.1	4.2	0.0	4.4
Longhorn	88.3	0.1	0.0	0.0	4.5	0.0	83.6	4.2	0.0	4.8
Interstate 84	84.8	0.1	0.0	0.1	4.5	0.0	80.0	4.2	0.0	5.0
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.5	0.2	0.0	0.1	4.5	0.0	88.6	4.2	0.0	4.5

Table 3-267. Parallel Facilities for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Parallel Linear Facilities (within 300 feet of reference centerline) (miles crossed)							Parallel Linear Facilities (from 300 feet to 2,000 feet from reference centerline) (miles crossed)							Total Miles Parallel Linear Facilities (within 300 feet)	Total Miles Parallel Linear Facilities (from 300 to 2,000 feet)	Total Number of Linear Facility Crossings
		69-kV[1]	115-kV[2]	138-kV	230-kV	500-kV	Pipeline	Roads	69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads			
Applicant's Proposed Action	91.9	12.4	*7.0*	0.0	0.0	0.3	0.1	36.2	2.4	0.0	0.0	3.9	0.4	0.8	38.4	36.9	38.2	94
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*0.0*	*0.0*	*0.0*	*3.1*	*0.0*	*0.0*	*5.9*	*0.5*	*5.9*	*4*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*6.1*	*0.0*	*0.0*	*1.2*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.0*	*5.0*	*6.2*	*0.2*	*10*
East of Bombing Range Road	92.3	13.2	7.0	0.0	0.0	0.3	0.1	38.0	2.8	0.0	0.0	3.9	0.4	0.9	38.2	38.7	37.8	96
Applicant's Proposed Action – Southern Route	99.1	12.2	7.0	0.0	0.0	0.3	0.1	38.6	1.0	0.0	0.0	3.9	0.4	0.8	45.0	39.0	45.0	105
West of Bombing Range Road – Southern Route	95.6	12.4	7.0	0.0	0.0	0.3	0.2	25.3	2.3	0.0	0.0	3.9	0.4	0.8	47.5	25.8	47.5	88
Longhorn	88.2	1.2	0.0	0.0	0.0	0.2	0.1	28.3	2.1	0.0	0.0	3.8	0.3	0.8	42.1	28.9	41.5	93
Interstate 84	84.7	0.7	0.0	0.0	0.4	0.2	0.2	37.0	4.6	0.0	0.0	5.6	0.3	0.8	35.9	37.7	35.6	88
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.0*	*15.2*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*	*0.0*	*1.8*	*15.4*	*1.7*	*18*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*0.0*	*3.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*11.7*	*18.5*	*0.0*	*25*
Interstate 84 – Southern Route	93.4	0.5	0.0	0.0	0.4	0.2	0.2	40.8	3.2	0.0	0.0	5.6	0.3	0.8	42.0	41.3	42.0	100

Table Notes:

69-kV transmission line would be replaced by the B2H Project 500-kV transmission line.

Mileage is approximate based on digitization of the 115-kV transmission line along Bombing Range Road.

Applicant's Proposed Action Alternative

This alternative predominately crosses private lands (76.7 miles) and 10.6 miles of DoD lands on the NWSTF Boardman. Other jurisdictions crossed include BLM and USFS lands.

This alternative is located within a designated utility corridor in the Wallowa-Whitman National Forest for 4.2 miles. In addition, this alternative is sited parallel to an existing facility (transmission line, pipeline, or road) for 36.9 miles (approximately one-third of the alternative length). This alternative does not parallel the existing 230-kV line to avoid crossing Interstate 84 twice.

As noted above, the Applicant's Proposed Action Alternative crosses 10.6 miles of DoD lands on the NWSTF Boardman within a 90-foot-wide use area, currently occupied by a 69-kV transmission line owned by BPA. The Applicant's Proposed Action Alternative is to "repurpose" the 90-foot-wide use area currently occupied by this 69-kV transmission line, which is under a land-use agreement between the Navy and BPA is dissolved, used of the land would be a new action between the Navy and the Applicant.

To allow the BPA to continue electrical service to customers serviced by the displaced 69-kV transmission line and accommodate the Applicant's requested use of the NWSTF Boardman property; the BPA and UEC are coordinating to relocate the BPA's 69-kV line. The UEC owns and operates a 115-kV transmission line on private land on the east side of Bombing Range Road to Homestead Lane where the line enters the Bombing Range Substation. The current proposal involves UEC rebuilding its existing 115-kV line to single-pole double-circuit structures to support the UEC 115-kV circuit and the BPA 69-kV circuit from Wilson Lane, at the north end of the NWSTF Boardman, to Homestead Lane; a distance of approximately 3.5 miles. The double-circuit 69/115-kV structures would be no taller than 100 feet, the typical footprint at the base of the structure would be a circle approximately 3 feet in diameter, and spans between structures would be approximately 400 to 600 feet. The double-circuit line is anticipated to occupy a right-of-way 55 feet wide.

From Homestead Lane, still east of Bombing Range Road and on private land, the 69-kV circuit would be extended south on new single-pole single-circuit structures for approximately 8.5 miles. Along this section of the line, the single-circuit 69-kV structures would be approximately 70 feet tall, the footprint at the base of the structure would be a circle approximately 2 feet in diameter, and spans between structures would be 400 to 600 feet. At the point where the proposed B2H Project would divert from the NWSTF Boardman property east onto private property, the 69-kV circuit would cross to the west side of Bombing Range Road and connect with the existing 69-kV H-frame line and continue on the NWSTF Boardman for approximately 3.9 miles then onto private land continuing farther south to serve the Columbia Basin Electric Cooperative load.

The impact on property ownership and rights will be carefully considered by the Applicant, during final design. Mitigation Measure 8 would be applied to allow for micro-siting of the B2H Project, where feasible, to avoid or minimize impacts on property ownership. The Applicant will negotiate with the owners of real property interests to ensure that, if any private property interests are impaired by the final location, they are appropriately compensated. Compensation for use of property would be

negotiated between the landowner (either private or public) and the Applicant during the land title or easement acquisition process. Any land valuation or easement negotiations on private property would not involve the BLM or other land-managing agencies Refer to Table 3-227 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 1.

Variation S1-B1

Variation S1-B1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation avoids the DoD lands on the NWSTF Boardman and also does not parallel the existing 230-kV transmission line to avoid crossing Interstate 84 twice. Variation S1-B1 is located within the Wallowa-Whitman National Forest designated utility corridor for 4.2 miles.

Variation S1-B2

Variation S1-B2 also avoids the DoD lands on the NWSTF Boardman but does parallel the existing 230-kV transmission line for 6.1 miles crossing Interstate 84 twice before rejoining the Segment 1 alternatives south of the interstate. Variation S1-B2 is located within the Wallowa-Whitman National Forest designated utility corridor for 3.7 miles.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

These design options would occur on private land only.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative predominately crosses private lands (85.7 miles) and avoids the DoD lands on the NWSTF Boardman. Other jurisdictions crossed include BLM and USFS lands. Refer to Table 3-227 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 1.

This alternative is located within a designated utility corridor in the Wallowa-Whitman National Forest for 4.2 miles.

This alternative differs from the Applicant's Proposed Action Alternative only in that it is sited parallel to Bombing Range Road on the east side rather than on the west side of the road. The route was partially developed to align with an existing transmission corridor. Along Bombing Range Road, the alternative route parallels BPA 69-kV line (located on the west side of Bombing Range Road) for approximately 13.2 miles. Similar to the Applicant's Proposed Action, this alternative does not parallel the existing 230-kV transmission line to avoid crossing Interstate 84 twice.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative predominately crosses private lands (83.8 miles) and 10.6 miles of DoD lands on the NWSTF Boardman. Other jurisdictions crossed include BLM and USFS lands. Refer to Table 3-227 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 1.

This alternative is located within a designated utility corridor in the Wallowa-Whitman National Forest for 4.2 miles.

In addition, this alternative is sited parallel to an existing facility (transmission line, pipeline, or road) for 39.0 miles (approximately one-third of the alternative length). This alternative does not parallel the existing 230-kV line to avoid crossing Interstate 84 twice.

Similar to the Applicant's Proposed Action Alternative, this alternative also crosses 10.6 miles of DoD lands on the NWSTF Boardman within a 90-foot-wide use are, currently occupied by a 69-kV transmission line owned by BPA.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The environmental consequences for this design option are the same as those described under Design Option 1 on the Applicant's Proposed Action Alternative.

Design Option 2

The environmental consequences for this design option are the same as those described under Design Option 2 on the Applicant's Proposed Action Alternative.

Design Option 3

The environmental consequences for this design option are the same as those described under Design Option 3 on the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative predominately crosses private lands (80.1 miles) and 10.6 miles of DoD lands on the NWSTF Boardman. Other jurisdictions crossed include BLM and USFS lands. Refer to Table 3-227 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 1.

This alternative is located within a designated utility corridor in the Wallowa-Whitman National Forest for 4.2 miles.

In addition, this alternative is sited parallel to an existing facility (transmission line, pipeline, or road) for 25.8 miles (approximately one-third of the alternative length). This alternative does not parallel the existing 230-kV line to avoid crossing Interstate 84 twice.

Similar to the Applicant's Proposed Action Alternative, this alternative also crosses 10.6 miles of DoD lands on the NWSTF Boardman within a 90-foot-wide use are, currently occupied by a 69-kV transmission line owned by BPA.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The environmental consequences for this design option are the same as those described under Design Option 1 on the Applicant's Proposed Action Alternative.

Design Option 2

The environmental consequences for this design option are the same as those described under Design Option 2 on the Applicant's Proposed Action Alternative.

Design Option 3

The environmental consequences for this design option are the same as those described under Design Option 3 on the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Longhorn Alternative predominately crosses private lands (83.6 miles) and avoids the DoD lands on the NWSTF Boardman. Other jurisdictions crossed include BLM and USFS lands. Refer to Table 3-227 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 1.

This alternative is located within a designated utility corridor in the Wallowa-Whitman National Forest for 4.2 miles.

In addition, this alternative parallels an existing facility (transmission line, pipeline, or road) for 28.9 miles (approximately one-third of the alternative length). This alternative does not parallel the existing 230-kV line to avoid crossing Interstate 84 twice.

Interstate 84 Alternative and Variations

The Interstate 84 Alternative predominately crosses private lands (80.0 miles) and crosses DoD lands on the Umatilla Ordnance Depot for 0.1 mile. Other jurisdictions crossed include BLM and USFS lands. Refer to Table 3-227 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 1.

This alternative is located within a designated utility corridor in the Wallowa-Whitman National Forest for 4.2 miles.

In addition, this alternative is sited parallel to an existing facility (transmission line, pipeline, or road) for 37.7 miles (approximately one-third of the alternative length). This alternative was developed with the intent to consolidate the proposed transmission line with other linear facilities and in areas already disturbed. This alternative parallels Interstate 84 for approximately 35 miles (except for approximately a 6-mile-long section just south of the Umatilla Ordnance Depot) to an area 6 miles west of Pendleton. This alternative does not parallel the existing 230-kV line to avoid crossing Interstate 84 twice.

Variation S1-A1

Variation S1-A1 is the same alignment as the Interstate 84 and Interstate 84 – Southern Route alternatives but is sited parallel to the existing 230-kV transmission line.

This variation is not within a designated utility corridor.

Variation S1-A2

Variation S1-A2 was developed to respond to the comments on the Draft EIS to site the B2H Project parallel to Interstate 84 and/or exiting 230-kV transmission line. This variation separates from the Interstate 84 and Interstate 84 – Southern Route alternatives by turning southeast in an area north of the community of Echo and parallels the existing 230-kV line crossing the Umatilla River approximately 15 miles west of Pendleton.

This variation is not within a designated utility corridor.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative predominately crosses private lands (88.6 miles) and crosses DoD lands on the Umatilla Ordnance Depot for 0.1 mile. Other jurisdictions crossed include BLM and USFS lands.

This alternative is located within a designated utility corridor in the Wallowa-Whitman National Forest for 4.2 miles. In addition, this alternative is sited parallel to an existing facility (transmission line, pipeline, or road) for 41.3 miles (approximately one-third of the alternative length). This alternative is similar to the Interstate 84 Alternative but extends the north-south portion farther south to connect with the Southern Route avoiding the McKay Creek area. This alternative does not parallel the existing 230-kV transmission line to avoid crossing Interstate 84 twice.

Conclusions

The reference centerlines for alternative routes in Segment 1 cross primarily private lands and some federal lands. The percentage of federal lands crossed by Segment 1 alternative routes ranges from 5.2 percent (Interstate 84—Southern Route Alternative) to 16.5 percent (Applicant's Proposed Action Alternative). Alternative routes in Segment 1 use designated utility corridors for similar distances. The total miles of parallel linear facilities within 2,000 feet of Segment 1 alternatives range from 70.4 miles (Longhorn Alternative) to 84.0 miles (Applicant's Proposed Action-Southern Route Alternative). The Applicant's Proposed Action Alternative crosses the most federal lands, and would parallel more existing linear facilities as compared to other Segment 1 alternative routes.

Existing Land Use

Table 3-268 and Table 3-269 present the residual impacts on existing land use types and structures for all alternative routes and route variations in Segment 1. For locations of residual impacts described below refer to MV-13.

Table 3-268. Existing Land Use Inventory Data and Overall Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (Miles)	Resource Inventory for Existing Land Use GAP Types (miles crossed)						Overall Residual Impacts for Existing Land Use GAP Types (miles crossed)		
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland	None	Low	Moderate
Applicant's Proposed Action	91.9	32.7	0.0	2.1	16.7	12.6	27.8	0.0	42.4	49.5
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*6.2*	*0.1*	*0.1*	*0.0*	*0.2*	*6.2*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.3*	*5.9*	*0.0*	*0.2*	*0.0*	*0.5*	*5.9*
East of Bombing Range Road	92.3	38.9	0.1	0.5	16.7	13.0	23.1	0.0	36.7	55.6
Applicant's Proposed Action to Southern Route	99.1	28.5	0.0	2.1	18.2	17.1	33.2	0.0	52.3	46.8
West of Bombing Range Road to Southern Route	95.6	20.0	0.0	1.9	18.2	22.2	33.3	0.0	57.3	38.3
Longhorn	88.2	35.2	0.0	1.0	16.7	13.7	21.6	0.0	36.3	51.9
Interstate 84	84.7	25.4	0.0	14.7	16.7	12.0	15.7	0.2	42.3	42.2
Variation S1-A1	*18.5*	*5.4*	*0.0*	*8.4*	*0.0*	*2.2*	*2.5*	*0.0*	*13.1*	*5.4*
Variation S1-A2	*18.5*	*5.7*	*0.0*	*0.0*	*0.0*	*1.9*	*10.9*	*0.0*	*12.7*	*5.8*
I-84 to Southern Route	93.4	22.7	0.0	14.7	18.2	16.7	20.9	0.2	52.2	41.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 49.5 miles of residual moderate impacts on existing land uses where the reference centerline of the route crosses irrigated agricultural areas and dry farmlands, or crosses near residential or agricultural structures. These temporary impacts associated with construction could include detouring of roads, removal of fencing, or non-intentional damage to property. In some cases, access to existing commercial or agricultural operations may be periodically hindered in areas where public and employee access is prohibited for safety reasons. Impacts resulting from the operation of the Applicant's Proposed Action Alternative would likely be minimal as agricultural operations could persist adjacent to and within areas of the right-of-way where transmission facilities could span agricultural features. No residual high impacts associated with Applicant's Proposed Action Alternative would be expected.

Table 3-269. Residual Impacts for Existing Land Use Structures for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Residual Impacts for Each Structure Type (miles crossed)																		Overall Residual Impacts on Structures (miles crossed)		
		Building (Non-residence)		Other		Residential		Rest Stop		Mining/ Extraction		Outstructure		Communication Facility		Power Substation		Windmill				
		None	Low	None	Moderate	None	Moderate	None	Moderate	None	Low	None	Low	None	Low	None	Low	None	Low	None	Low	Moderate
Applicant's Proposed Action	91.9	91.7	0.2	91.7	0.2	91.8	0.1	91.9	0.0	91.9	0.0	91.4	0.5	91.9	0.0	91.7	0.2	91.9	0.0	90.7	0.9	0.3
Variation S1-B1	*6.4*	*6.4*	*0.0*	*6.4*	*0.0*	*6.3*	*0.1*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.3*	*0.0*	*0.1*
Variation S1-B2	*6.4*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	92.1	0.2	92.0	0.3	92.2	0.1	92.3	0.0	92.3	0.0	91.8	0.5	92.3	0.0	92.0	0.3	92.3	0.0	91.1	0.8	0.4
Applicant's Proposed Action to Southern Route	99.1	98.9	0.2	98.9	0.2	99.0	0.1	99.1	0.0	99.1	0.0	98.6	0.5	99.1	0.0	98.9	0.2	99.1	0.0	97.9	0.9	0.3
West of Bombing Range Road to Southern Route	95.6	95.4	0.2	95.4	0.2	95.5	0.1	95.6	0.0	95.6	0.0	95.2	0.4	95.6	0.0	95.4	0.2	95.6	0.0	94.5	0.8	0.3
Longhorn	88.2	87.7	0.5	88.1	0.1	87.9	0.3	88.2	0.0	88.2	0.0	86.7	1.5	88.2	0.0	88.1	0.1	88.2	0.0	86.2	1.6	0.4
InterstateI-84	84.7	83.2	1.5	84.7	0.0	84.3	0.4	84.6	0.1	84.7	0.0	83.5	1.2	84.6	0.1	84.6	0.1	84.7	0.0	81.7	2.5	0.5
Variation S1-A1	*18.5*	*17.8*	*0.7*	*18.5*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*	*18.2*	*0.3*	*18.4*	*0.1*	*18.5*	*0.0*	*18.5*	*0.0*	*17.5*	*1.0*	*0.0*
Variation S1-A2	*18.5*	*18.3*	*0.2*	*18.5*	*0.0*	*18.3*	*0.2*	*18.5*	*0.0*	*18.5*	*0.0*	*18.2*	*0.3*	*18.5*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*	*18.2*	*0.1*	*0.2*
I-84 to Southern Route	93.4	91.9	1.5	93.4	0.0	93.0	0.4	93.3	0.1	93.4	0.0	92.2	1.2	93.3	0.1	93.3	0.1	93.4	0.0	90.4	2.5	0.5

Variation S1-B1

Variation S1-B1 would result in 6.2 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas that could result in short-term conflicts with natural resource development. These temporary impacts associated with construction could include detouring of roads, removal of fencing. In some cases, access to existing forest/woodland areas may be periodically hindered where public and employee access is prohibited for safety reasons. No residual high impacts associated with Variation S1-B1 would be expected.

Variation S1-B2

Similar to Variation S1-B1, Variation S1-B2 would result in 5.9 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas. No residual high impacts associated with Variation S1-B2 would be expected.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1 Through 3

Impacts associated with the additional action on existing land uses would be similar to those described for the Applicant's Proposed Action Alternative where the existing line UEC 115-kV line would be upgraded to a double circuit. Additional new right-of-way where the proposed additional action extends beyond Homestead Lane could temporarily affect areas of irrigated farmland during construction of the facilities. Impacts resulting from the operation of the additional action would likely be minimal as agricultural operations could persist adjacent to and within areas of the right-of-way where transmission facilities could span agricultural features.

East of Bombing Range Road Alternative

East of the Bombing Range Road Alternative would result in 55.6 miles of moderate impacts on existing land uses where the centerline of the alternative route crosses irrigated agricultural areas and dry farmlands, or crosses near residential or agricultural structures. These impacts would be similar to those described for the Applicant's Proposed Action Alternative (west of Bombing Range Road Alternative). No residual high impacts associated with this alternative would be expected.

Applicant's Proposed Action – Southern Route Alternative

Applicant's Proposed Action – Southern Route Alternative would result in 46.8 miles of residual moderate impacts on existing land uses where the centerline of the alternative route crosses irrigated agricultural areas and dry farmlands, or crosses near residential or agricultural structures. These impacts would be similar to those described for the Applicant's Proposed Action (west of Bombing Range Road Alternative). No residual high impacts associated with this alternative would be expected.

West of Bombing Range Road – Southern Route Alternative

West of Bombing Range Road – Southern Route Alternative would result in 38.3 miles of moderate impacts on existing land uses where the centerline of the alternative route crosses irrigated agricultural areas and dry farmlands, or crosses near residential or agricultural structures. These impacts would be similar to those described for the Applicant's Proposed Action Alternative (west of Bombing Range

Road Alternative). No residual high impacts associated with this alternative would be expected. No residual high impacts associated with this alternative would be expected.

Longhorn Alternative

The Longhorn Alternative would result in 51.9 miles of moderate impacts on existing land uses where the reference centerline crosses irrigated agricultural areas and dry farmlands, or crosses near residential or agricultural structures. These impacts would be similar to those described for the Applicant's Proposed Action Alternative (west of Bombing Range Road Alternative). No residual high impacts associated with this alternative would be expected.

Interstate 84 Alternative

Interstate 84 Alternative would result in 42.7 miles of moderate impacts on existing land uses where the reference centerline crosses irrigated agricultural areas and dry farmlands, or near residences. These impacts would be similar to those described for the Applicant's Proposed Action Alternative (west of Bombing Range Road Alternative). Where this alternative crosses southwest portions of the Umatilla Ordnance Depot for approximately 0.1 mile, the reference centerline is colocated between the interstate to the south and a railroad to the north. Therefore, low impacts would be expected to DoD land uses in this area. No residual high impacts associated with this alternative would be expected.

Variation S1-A1

Variation S1-A1 would result in 5.4 miles of moderate impacts on existing land uses where the reference centerline crosses irrigated agricultural areas and dry farmlands. These impacts would be similar to those described for the Applicant's Proposed Action Alternative (west of Bombing Range Road Alternative). No residual high impacts associated with this variation would be expected.

Variation S1-A2

Variation S1-A2 would have 5.8 miles of residual moderate impacts on existing land uses where the centerline of the route crosses irrigated agricultural areas and dry farmlands. These impacts would be similar to those described for the Applicant's Proposed Action Alternative (west of Bombing Range Road Alternative). No residual high impacts associated with this variation would be expected.

Interstate 84 – Southern Route Alternative

Interstate 84 – Southern Route Alternative would result in 41.0 miles of moderate impacts on existing land uses where the reference centerline crosses irrigated agricultural areas and dry farmlands, or near residences. These impacts would be similar to those described for the Applicant's Proposed Action Alternative (west of Bombing Range Road Alternative). Where this alternative crosses southwest portions of the Umatilla Ordnance Depot for approximately 0.1 mile, the reference centerline is colocated between the interstate to the south and a railroad to the north. Therefore, low impacts would be expected to DoD land uses in this area. No residual high impacts associated with this alternative would be expected.

Conclusions

In Segment 1, no high residual impacts are anticipated on existing land uses from any of the alternatives. Moderate residual impacts associated with Segment 1 alternative routes would occur where the Project would cross agricultural or forested/woodland areas, or near residences and other structures. The lengths of the alternative routes in this segment range from 84.7 miles (Interstate 84 Alternative) to 99.1 miles (Applicant's Proposed Action to Southern Route Alternative). Overall, moderate residual impacts on existing land uses would range from 38.3 miles (West of Bombing Range Road to Southern Route Alternative) to 55.6 miles (East of Bombing Range Road Alternative). Considering the overall length of an alternative route and the extent of moderate residual impacts, the I-84 to Southern Route Alternative would have the least effects on existing land uses among the alternative routes in Segment 1. There is no notable difference in impacts on existing land uses among the variations.

Timber Management

Applicant's Proposed Action Alternative

All of the potential impacts on timber management presented in Section 3.2.6.1 could occur wherever forested lands are crossed by the Applicant's Proposed Action in Segment 1. These impacts can be summarized as a potential loss of harvestable timber, a loss of future timber revenue, and potential constraints on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

Table 3-228 provides miles crossed of forested lands on each alternative route in Segment 1. Impacts on lands administered by the USFS would be evaluated under the management direction in the LRMP. Impacts on forested private lands would vary with the landowner and their individual concerns. The Applicant will negotiate with the landowner regarding compensation for timber values lost or reduced as a result of the B2H Project.

Goal 4 of the Oregon Statewide Local Planning Goals includes the following requirements for siting transmission lines on forested lands:

- The proposed use must not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands.
- The proposed use must not significantly increase fire hazard or significantly increase fire-suppression costs or significantly increase risks to fire-suppression personnel.
- The proposed use has the least impact on nearby or adjoining forest or agricultural lands.
- The siting ensures that adverse impacts on forest operations and accepted farming practices on the tract will be minimized.
- The amount of forest lands used to site access roads, service corridors, and structures is minimized.
- The risks associated with wildfire are minimized.

Through right-of-way fees and compensation to landowners, the Applicant would ensure that significant changes in cost or forest practices do not result from the B2H Project. Design features of the B2H Project for environmental protection address the requirements to minimize fire hazard, risks to fire-suppression personnel, impacts on forest operations, and the amount of forested lands used for access roads and other components.

Other Alternative Routes and Variations in Segment 1

Potential impacts on timber management on all other alternative routes and variations in Segment 1 would be similar, wherever forested vegetation is crossed.

Conclusions

There is no discernable difference in impacts on timber management among the alternative routes and variations analyzed in Segment 1.

Fire Management

Refer to the discussion in the Effects Common to All Alternatives section.

Conclusions

There is no discernable difference in impacts on fire management among the alternative routes and variations analyzed in Segment 1.

Zoning

The result of the effects analysis for zoning for the alternatives and route variations in Segment 1 are described below in terms of miles crossed of EFU or ERU zones. As discussed in Effects Common to All Alternatives for Zoning there are no identified zones crossed that prohibit the development of the B2H Project facilities; however, in areas where the B2H Project crosses EFU or ERU zones, the Applicant would have to demonstrate necessity as described in Section 3.2.6.2 Regulatory Framework. In all cases, the potential effect of not demonstrating necessity could result in non-conformance with Oregon Statewide Planning Goals. Refer to MV-14 for locations of EFU and ERU zoning.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action crosses approximately 64.0 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S1-B1 and Variation S1-B1 would not cross any EFU zoning, thus no identifiable impacts would occur on property zoned for EFU.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1 through 3

The additional action associated with Design Options 1 through 3 crosses EFU zoning in areas where new right-of-way would be needed south of Homestead Lane. Potential effects are discussed in Effects Common to All Alternatives.

East of Bombing Range Road Alternative

The East of Bombing Range Road Alternative crosses 75.2 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Applicant's Proposed Action – Southern Route Alternative

The Applicant's Proposed Action – Southern Route Alternative crosses 70.2 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1 through 3

The additional action associated with Design Options 1 through 3 crosses EFU zoning in areas where new right-of-way would be needed south of Homestead Lane. Potential effects are discussed in Effects Common to All Alternatives.

West of Bombing Range Road – Southern Route Alternative

The West of Bombing Range Road – Southern Route Alternative crosses 66.7 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1 through 3

The additional action associated with Design Options 1 through 3 crosses EFU zoning in areas where new right-of-way would be needed south of Homestead Lane. Potential effects are discussed in Effects Common to All Alternatives.

Longhorn Alternative

The Longhorn Alternative crosses 71.7 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Interstate 84 Alternative and Variations

The Interstate 84 Alternative crosses 65.6 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S1-A1

The Variation S1-A1 crosses 18.1 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S1-A2

The Variation S1-A2 crosses 18.5 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Interstate 84 – Southern Route Alternative

The Interstate 84 – Southern Route Alternative crosses 73.3 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Conclusions

Because the Applicant has elected to demonstrate compliance with statewide planning goals by under Path B, the EFSC would determine whether the project complies with applicable Land Conservation and Development Commission rules and land-use statutes (including statewide planning goals), and any applicable, substantive criteria from each county's local comprehensive plan and land-use regulations. There is no notable difference among Segment 1 alternative routes or variations with regard to zoning. All cross similar distances of EFU zones.

Military Training

Table 3-266 presents the residual impacts on MTRs for the alternatives and route variations in Segment 1.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would parallel the west side of Bombing Range Road for approximately 12 miles within a 90-foot-wide use area currently occupied by a 69-kV transmission line owned by BPA, on NWSTF Boardman property. It is anticipated that a new 90-foot-wide easement for the repurposing of this area would be needed for the proposed 500-kV transmission line. Repurposing the 90-foot-wide easement (currently used by BPA) would dissolve the existing land use agreement and require the development of a new land-use agreement between the Applicant and the Navy. At the southern terminus of Bombing Range Road; the Applicant's Proposed Action turns east crossing areas of irrigated and dryland agriculture for approximately 40 miles and exiting the boundaries of the NWSTF Boardman within Segment 1.

NWSTF Boardman has expressed concern regarding the construction of transmission line structures within special-use airspace in proximity of Bombing Range Road. Potential effects from the Applicant's Proposed Action would include the potential for restriction of aircraft movement during training operations. In addition the presence of structures and conductors within special-use airspace would create potential collision hazards with B2H Project facilities.

The B2H Project description includes structure-design modifications to meet the requirements of the Navy and the FAA in response to NWSTF Boardman's request to limit tower heights to 100 feet or less, and to allow NWSTF Boardman to meet their training mission. Transmission line structure-design modification would be effective in meeting NWSTF Boardman's request to limit structure heights to 100 feet or less and allowing NWSTF Boardman to meet their training mission (M. Vaughn, Idaho Power Company, email communication with author, 2016). As discussed in Section 2.3.1.2, the single-circuit two-pole H-frame structure could be used along the boundary of NWSTF Boardman. These structure types vary in height from 85 to 100 feet and require 9 to 12 structures per mile (450 to 600 foot span between structures) (refer to Table 2-1). Therefore, the configuration of the single-circuit two-pole H-frame structures would be effective in mitigating impacts on training activities within special-use airspace. In addition, structures, conductors, and/or shield wires would be marked with high-visibility devices (i.e., markerballs or other marking devices) where required by NWSTF Boardman and/or FAA.

The FAA requires utility line separation from runways and horizontal and conical zones for the safety of the planes and helicopters using the air space. The FAA will require a Notice of Proposed Construction or Alteration (Form 7460-1); and after review of the notice, the FAA will issue either a Determination of No Hazard to Air Navigation or a Notice of Presumed Hazard. This, along with other required permits, authorizations, and evidence would be provided to the BLM prior to issuance of a Notice to Proceed. The obstruction evaluation/airport airspace analysis would determine whether a structure or span exceeds or is within the criteria identified by the FAA, refer to Section 3.2.9 for further discussion.

In addition, the Navy provided comments on the Draft EIS indicating a preference for colocation of the B2H Project with existing aboveground infrastructure to minimize impacts on existing flight patterns and training operations (Appendix K). Coordination with owners of existing utilities would be necessary during design and construction to avoid conflicts. The Applicant plans to coordinate closely with the Navy regarding entry agreement for survey work, the need for a new land-use agreement, siting and design of transmission line structures, structure placement, and construction staging activities.

Ground-disturbing activities associated with construction, operation, and maintenance of the Applicant's Proposed Action Alternative could result in a risk associated with unexploded ordnance. Specifically, effects of the Applicant's Proposed Action Alternative include the need for NWSTF Boardman to undergo extensive underground ordnance clearance and disposal efforts. To reduce this risk, the Applicant plans to repurpose the same 90-foot right-of-way currently occupied by BPA's 69-kV transmission line. In addition, the Applicant plans to utilize the existing firebreak areas for staging of construction, operation, and activities to limit ground disturbing to areas that have been cleared of unexploded ordnance. However, the Navy has indicated that an Explosives Safety and Munitions Response plan would be required by the Applicant. In addition, the Navy assumes that any ground disturbance, even in areas previously disturbed, would require UXO protocols (K. Mathes, email communication with NWSTF Boardman, April 12 and 21, 2016).

Variations S1-B1 and S1-B2

Impacts on military training in special-use airspace would be the same as those discussed for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Design Option 1 removes approximately 12.2 miles of the existing 69-kV line and leaving this portion of the right-of-way clear of transmission line infrastructure. The transmission line would be reconstructed on the east side of Bombing Range Road as a double-circuit 230-kV line. The Applicant has indicated that the structures would have a span of 400 to 600 feet and be no taller than 100 feet. The proposed Option 1 would be colocated with the B2H Project 500-kV line. Colocation of these lines would not result in additional conflicts or obstacles for aerial training activities due to their proximity to each other. The nature of impacts would be the same as those discussed for the Applicant's Proposed Action Alternative.

Design Option 2

Option 2 would completely remove the existing 69-kV line (15.6 miles) from the west side of Bombing Range Road. The line would be reconstructed on the east side of Bombing Range Road as a double-circuit 230-kV line. The right-of-way on NWSTF Boardman property would repurposed for construction of the B2H Project 500-kV line. The new 230-kV would be colocated with the B2H Project 500-kV line. Colocation of these lines would not result in additional conflicts or obstacles for aerial training activities due to their proximity to each other. The nature of impacts would be the same as those discussed for the Applicant's Proposed Action Alternative.

Design Option 3

Option 3 would completely remove the existing 69-kV line (15.6 miles) from the west side of Bombing Range Road. The line would be reconstructed on the east side of Bombing Range Road as a double-circuit 230-kV line. The right-of-way on NWSTF Boardman property would repurposed for construction of the B2H Project 500-kV line. In addition, a new step down station would be constructed near the southern terminus of Bombing Range Road. The new 230-kV would be colocated with the B2H Project 500-kV line. Colocation of these lines would not result in additional conflicts or obstacles for aerial training activities due to their proximity to each other. The nature of impacts would be the same as those discussed for the Applicant's Proposed Action Alternative.

East of Bombing Range Road Alternative

Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative since the East of Bombing Range Road Alternative crosses the same amount (15.1 miles) of special-use airspace. However, the East of Bombing Range Road Alternative would be built on privately owned (and small portion of state) land east of Bombing Range Road instead of on NWSTF Boardman property. At the southern terminus of Bombing Range Road, the alignment would continue east, exiting the boundaries of the MTRs within Segment 1, continuing along the same alignment as the Applicant's Proposed Action Alternative.

The East of Bombing Range Road Alternative would minimize encroachment on NWSTF Boardman Special-use Airspace through colocation of the proposed B2H Project with the existing end-user connection 115-kV transmission line. The use of private lands east of Bombing Range Road would not require a new land-use agreement between the Applicant and the Navy. Coordination with NWSTF Boardman and FAA, including an obstruction evaluation/airport airspace analysis, would be necessary to determine whether the East of Bombing Range Road Alternative meets FAA criteria.

In addition, NWSTF Boardman provided comment on the Draft EIS indicating a preference for colocation of the B2H Project with existing aboveground infrastructure to minimize impacts on existing flight patterns and training operations (Appendix K). Coordination with owners of existing utilities would be necessary during design and construction to avoid conflicts.

Applicant's Proposed Action – Southern Route Alternative

Effects on military training in special-use airspace from the Applicant's Proposed Action – Southern Route Alternative would be the same as those discussed for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Effects on military training in special-use airspace would be the same as those discussed for the Applicant's Proposed Action Alternative: Design Option 1.

Design Option 2

Effects on military training in special-use airspace would be the same as those discussed for the Applicant's Proposed Action Alternative: Design Option 2.

Design Option 3

Effects on military training in special-use airspace would be the same as those discussed for the Applicant's Proposed Action Alternative: Design Option 3.

West of Bombing Range Road – Southern Route Alternative

Impacts on military training in special-use airspace from the West of Bombing Range Road – Southern Route Alternative would be the same as those discussed for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Effects would be the same as those described for the Applicant's Proposed Action Alternative: Design Option 1.

Design Option 2

Effects would be the same as those described for the Applicant's Proposed Action Alternative: Design Option 2.

Design Option 3

Effects would be the same as those described for the Applicant's Proposed Action Alternative: Design Option 3.

Longhorn Alternative

Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative since the Longhorn Alternative also crosses special-use airspace (17.6 miles). The Longhorn Alternative crosses more special-use airspace than the Applicant's Proposed Action Alternative. The Longhorn Alternative is located 4.0 miles east of Bombing Range Road and would result in greater impact on special-use airspace operations. NWSTF Boardman provided comment indicating that the Longhorn Alternative would not be compatible with training operations and would result in additional obstacles in the existing flight patterns used for training (Appendix K).

Therefore, the Longhorn Alternative crosses more special-use airspace and creates a north-south obstacle resulting in a potential risk for collision with the B2H Project transmission lines. Coordination with NWSTF Boardman, other military users, and FAA, including an obstruction evaluation/airport airspace analysis, would be necessary to determine whether the Longhorn Alternative meets FAA criteria.

Interstate 84 Alternative and Variations

Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative since the Interstate 84 Alternative also crosses special-use airspace. However, the Interstate 84 Alternative is located along the Interstate 84 to allow for colocation of the B2H Project with an existing transportation corridor. The addition of the B2H Project would create an east-west obstacle for special-use airspace operations along the interstate. The Interstate 84 Alternative exits the boundary of special-use airspace before it turns south toward Pilot Rock, Oregon. Coordination with NWSTF Boardman, other military, and FAA, including an obstruction evaluation/airport airspace analysis, would be necessary to determine whether the Interstate 84 Alternative meets FAA criteria.

Variation S1-A1 and Variation S1-A2 do not cross MTRs; therefore, no effects are anticipated to occur.

Interstate 84 – Southern Route Alternative

Impacts on military training in special-use airspace would be the same as those discussed for the Interstate 84 Alternative.

Conclusions

All alternative routes analyzed in Segment 1 cross MTRs, however Variations S1-B1, S1-B2, S1-A1, and S1-A2 do not cross MTRs.

Specially Designated Areas

Table 3-270 presents the miles crossed for specially designated areas for the alternatives and route variations in Segment 1.

Table 3-270. Specially Designated Areas in Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Area of Critical Environmental Concern	Wildlife Area	Research Natural Area
Applicant's Proposed Action	91.9	0.0	0.0	1.3
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	0.0	0.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	1.3
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	1.3
Longhorn	88.2	0.0	0.0	0.0
Interstate 84	84.7	0.0	0.0	0.0

Table 3-270. Specially Designated Areas in Segment 1—Morrow-Umatilla (miles crossed)				
Alternative Route	**Total Length (miles)**	**Area of Critical Environmental Concern**	**Wildlife Area**	**Research Natural Area**
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	0.0	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses 1.3 miles of the RNA – B on the NWTSF Boardman (Link 1-27). Management of the RNA prescribed in the NWTSF Boardman INRMP does not preclude transmission lines from crossing the RNA; however any development in RNA-B is not consistent with Navy management for the area as identified in the INRMP and underlying governing requirements of designated ecological reserves. Securing an easement across the RNA would require coordination with the Navy and The Nature Conservancy. As discussed in the Mitigation Planning and Effectiveness section, application of Mitigation Measures 1, 2, 5, 6, 8, 12, 13, 14, and 15 (refer to Table 2-13) on the resources present in this area would minimize the potential effects of the B2H Project and management of this area for the established objectives would not be precluded. Temporary disturbance to sensitive soils, wildlife, and vegetation during construction is anticipated in this RNA. Refer to Sections 3.2.3 and 3.2.4 for further information regarding potential effects on vegetation and wildlife in this RNA.

Although the Coyote Springs Wildlife Area is in the study corridor for this alternative, it is not anticipated this wildlife area would be affected by the B2H Project.

Variations S1-B1 and S1-B2

These variations do not cross any specially designated areas.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Effects would be similar to those discussed for construction of the Applicant's Proposed Action Alternative; however, impacts would be limited to a smaller area associated with these design options. Additional temporary disturbance to sensitive soils, wildlife, and vegetation during removal of the existing 69-kV line would be anticipated.

East of Bombing Range Road Alternative

This alternative does not cross any specially designated areas.

Applicant's Proposed Action – Southern Route Alternative

This alternative crosses the same specially designated areas as the Applicant's Proposed Action Alternative and would have the same potential effects.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Effects would be the same as those discussed for the Applicant's Proposed Action Alternative; however, impacts would be limited to a smaller area associated with these design options.

West of Bombing Range Road – Southern Route Alternative

This alternative crosses the same specially designated areas as the Applicant's Proposed Action Alternative and would have the same potential effects.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Effects would be the same as those discussed for the Applicant's Proposed Action Alternative; however, impacts would be limited to a smaller area associated with these design options.

Longhorn Alternative

This alternative does not cross any specially designated areas.

Interstate 84 Alternative

This alternative does not cross any specially designated areas.

Variations S1-A1 and S1-A2

These variations do not cross any specially designated areas.

Interstate 84 – Southern Route Alternative

This alternative does not cross any specially designated areas.

Conclusions

The Applicant's Proposed Action Alternative, Applicant's Proposed Action – Southern Route Alternative, and West of Bombing Range Road – Southern Route Alternative cross RNA-B on NWSTF Boardman. Development in RNA-B is not consistent with Navy management for the area as identified in the INRMP and underlying governing requirements of designated ecological reserves. There is no discernable difference in impacts among the other alternative routes analyzed in Segment 1.

SEGMENT 2—BLUE MOUNTAINS

Land Ownership, Utility Corridors, and Parallel Facilities

Table 3-271 and Table 3-272 present the miles of land ownership and utility corridors crossed for the alternatives and route variations in Segment 2.

Table 3-271. Land Ownership and Utility Corridors in Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length (miles)	Land Ownership						Utility Corridors		
		Bureau of Land Management	Bureau of Reclamation	Department of Defense	U.S. Forest Service	State	Private	Resource Management Plan	West-Wide Energy Corridor	Percent within Utility Corridor
Applicant's Proposed Action	33.8	0.8	0.0	0.0	1.3	0.0	31.7	1.3	0.0	3.8
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*1.3*	*0.0*	*1.5*	*1.3*	*0.0*	*46.4*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*2.5*	*0.0*	*0.4*	*2.5*	*0.0*	*86.2*
Variation S2-B1	*3.7*	*0.8*	*0.0*	*0.0*	*0.0*	*0.0*	*2.9*	*0.0*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.8*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*9.3*	*0.0*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*8.8*	*0.0*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.6*	*0.0*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*12.1*	*0.0*	*0.0*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*12.2*	*0.0*	*0.0*	*0.0*
Glass Hill	33.7	0.5	0.0	0.0	1.3	0.0	31.9	1.3	0.0	3.9
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.3*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.1*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	0.0	0.0	0.0	2.5	0.0	31.5	2.5	0.0	7.4

Applicant's Proposed Action Alternative

This alternative predominately crosses private lands (31.7 miles). Other jurisdictions crossed include USFS lands.

This alternative is within a RMP utility corridor for USFS for 1.3 miles. The Applicant's Proposed Action Alternative is sited parallel (within 300 to 2,000 feet of route centerline) to existing roads (18.6 miles) and 230-kV transmission lines (10 miles).

Variation S2-A1

Variation S2-A1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation predominately crosses private (1.5 miles) and USFS (1.3 miles) lands.

Variation S2-A1 is within a RMP utility corridor for USFS for 1.3 miles and parallels Interstate 84 for 3 miles to an area west of Hilgard Junction State Park.

Table 3-272. Parallel Facilities in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Parallel Linear Facilities (within 300 feet of reference centerline) (miles)							Parallel Linear Facilities (from 300 feet to 2,000 feet from reference centerline) (miles)							Total Miles Parallel Linear Facilities (within 300 feet)	Total Miles Parallel Linear Facilities (from 300 to 2,000 feet)	Total Number of Linear Facility Crossings
		69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads	69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads			
Applicant's Proposed Action	33.8	0.0	0.1	0.0	0.3	0.0	0.4	4.2	0.0	0.7	0.0	10.3	0.0	2.7	18.6	4.9	26.3	30
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.7*	*0.0*	*0.0*	*0.7*	*0.2*	*2.7*	*1*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*2.9*	*0.0*	*1*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*2.3*	*0.5*	*2.8*	*3*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*2.5*	*0.0*	*0.1*	*1.1*	*0.0*	*0.0*	*0.0*	*1.0*	*0.0*	*1.2*	*1.8*	*2.6*	*1.2*	*4*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*1.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.2*	*6.4*	*1.9*	*7.0*	*8*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.2*	*5.7*	*1.6*	*7.0*	*6*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*2.0*	*0.2*	*2.0*	*1*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*1.8*	*0.0*	*0.0*	*2.1*	*0.4*	*2.2*	*2*
Variation S2-F1	*12.1*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.2*	*1.3*	*0.0*	*0.7*	*0.0*	*7.1*	*0.0*	*0.0*	*4.9*	*1.4*	*9.0*	*12*
Variation S2-F2	*12.2*	*0.0*	*0.1*	*0.0*	*11.5*	*0.0*	*0.1*	*0.9*	*0.0*	*0.7*	*0.0*	*0.7*	*0.0*	*0.0*	*5.0*	*11.5*	*0.7*	*12*
Glass Hill	33.7	0.0	0.1	0.0	0.3	0.0	*0.2*	*5.0*	0.0	0.7	0.0	*10.3*	*0.0*	*1.0*	*18.4*	*5.5*	*24.9*	*31*
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.0*	*2.6*	*0.4*	*2.6*	*3*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*2.3*	*0.7*	*2.3*	*4*
Mill Creek	34.0	0.0	0.1	0.0	26.9	0.0	0.5	4.4	0.0	0.7	0.0	4.0	0.0	3.3	16.7	27.8	5.6	36

Variation S2-A2

Variation S2-A2 predominately crosses USFS (2.5 miles) lands.

Variation S2-A2 is located within an RMP utility corridor for USFWS for 2.5 miles. Variation S2-A2 is colocated with existing 230-kV transmission line for 2.9 miles before rejoining the Applicant's Proposed Action Alternative west of Hilgard Junction State Park.

Variation S2-B1

Variation S2-B1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation predominately crosses private lands (2.9 miles) and BLM-administered lands (0.8 mile).

Variation S2-B1 is not located in a utility corridor; however, this variation is located within 0.5 mile of an existing 230-kV transmission line.

Variation S2-B2

Variation S2-B2 is similar to Variation S2-B1 but is located solely on private lands.

Variation S2-B2 is not located within a designated utility corridor. This variation separates from the Applicant's Proposed Action Alternative to more closely parallel the existing 230-kV transmission line.

Variation S2-C1

Variation S2-C1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation solely crosses private lands (9.3 miles) and is not located within a utility corridor.

This variation provides some opportunity to parallel existing roadway facilities within 300 of centerline and 300 to 2,000 feet from centerline of the proposed route.

Variation S2-C2

Variation S2-C2 solely crosses private lands (8.8 miles) and is not located within a utility corridor.

This variation provides less opportunity for colocation with existing roadway facilities than the Applicant's Proposed Action Alternative.

Variation S2-E1

Variation S2-E1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation solely crosses private lands (2.3 miles) and is not located within a utility corridor.

This variation provides minimal opportunity for colocation with existing facilities.

Variation S2-E2

Variation S2-E2 solely crosses private lands (2.6 miles).This variation separates from the Applicant's Proposed Action Alternative and is not located within a utility corridor.

This variation provides less opportunity for colocation with existing roadway facilities than the Applicant's Proposed Action Alternative.

Variation S2-F1

Variation S2-F1 shares the same alignment as all of the Segment 2 alternatives. This variation solely crosses private lands (12.1 miles) and is not located within a utility corridor.

This variation provides less opportunity for colocation with existing roadway facilities than the Applicant's Proposed Action Alternative.

Variation S2-F2

Variation S2-F2 solely crosses private lands (12.2 miles) and is not located within a utility corridor.

This variation provides the more opportunity for colocation with existing transmission line facilities than the other route variations. Variation S2-F2 separates from the Applicant's Proposed Action Alternative to parallel an existing 230-kV transmission line for 12 miles.

Glass Hill Alternative

The Glass Hill Alternative separates from the Applicant's Proposed Action Alternative to provide greater distance from Ladd Marsh and address concerns about visibility of the transmission line from La Grande. This alternative is located predominately on private lands (31.9 miles). The Glass Hill Alternative is located within an USFS RMP corridor for 1.3 miles.

This alternative is sited parallel (300 to 2,000 feet) to an existing 230-kV transmission line for approximately 10 miles and existing roadway for approximately 18 miles.

Variation S2-D1

Variation S2-D1 shares the same alignment as the Glass Hill Alternative. Therefore impacts on land ownership would be the same as those described for the Glass Hill Alternative.

Variation S2-D2

Variation S2-D2 is located solely on private lands (4.1 miles) and is not located within a designated utility corridor.

This variation provides less opportunity for colocation or parallel existing utility and roadway facilities than the Glass Hills Alternative.

Mill Creek Alternative

The Mill Creek Alternative separates from the Applicant's Proposed Action Alternative to parallel an existing 230-kV line. This alternative crosses predominately private land (31.5) and is located within a USFS RMP corridor for 2.5 miles.

The Mill Creek Alternative provides the most opportunity to parallel an existing utilities within 300 feet of the B2H Project in Segment 2.

Conclusions

There is little difference with regard to land ownership among the alternative routes and variations within Segment 2. Additionally, Segment 2 alternatives cross between 1.3 miles (Applicant's Proposed Action Alternative and the Glass Hill Alternative) and 2.5 miles (Mill Creek Alternative) of designated

utility corridors. The total miles of parallel linear facilities within 2,000 feet of Segment 2 alternative routes range from 30.4 miles (Glass Hill Alternative) to 33.4 miles (Mill Creek Alternative). The Mill Creek Alternative would use more designated utility corridors, and would parallel more existing linear facilities among the alternative routes analyzed in Segment 2.

Existing Land Use

Table 3-273 and Table 3-274 present the residual impacts on existing land use types and structures for all alternative routes and route variations in Segment 2. For locations of residual impacts described below refer to MV-13.

Table 3-273. Existing Land Use Inventory Data and Overall Residual Impacts for Segment 2—Blue Mountains

Alternative Route	Total Length (Miles)	Resource Inventory for Existing Land Use GAP Types (miles crossed)						Overall Residual Impacts for Existing Land Use GAP Types (miles crossed)		
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland	None	Low	Moderate
Applicant's Proposed Action	33.8	0.6	0.0	0.1	14.0	1.6	17.5	0.0	19.2	14.6
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*1.6*	*0.8*	*0.4*	*0.0*	*1.2*	*1.6*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*2.1*	*0.5*	*0.3*	*0.0*	*0.8*	*2.1*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*2.0*	*0.0*	*1.7*	*0.0*	*1.7*	*2.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*2.2*	*0.0*	*1.6*	*0.0*	*1.6*	*2.2*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*6.4*	*0.0*	*2.9*	*0.0*	*2.9*	*6.4*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*6.1*	*0.0*	*2.7*	*0.0*	*2.7*	*6.1*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*1.6*	*0.0*	*0.7*	*0.0*	*0.7*	*1.6*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*1.4*	*0.0*	*1.2*	*0.0*	*1.2*	*1.4*
Variation S2-F1	*12.1*	*0.5*	*0.0*	*0.1*	*0.7*	*0.8*	*10.0*	*0.0*	*10.9*	*1.2*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.1*	*0.2*	*0.7*	*11.2*	*0.0*	*12*	*0.2*
Glass Hill	33.7	0.6	0.2	0.1	12.8	1.6	18.4	0.0	20.3	13.4
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*3.7*	*0.0*	*0.6*	*0.0*	*0.6*	*3.7*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*3.2*	*0.7*	*0.2*	*0.0*	*0.9*	*3.2*
Mill Creek	34.0	0.4	0.1	0.2	10.5	2.1	20.7	0.0	23.1	10.9

Table 3-274. Residual Impacts for Existing Land Use Structures for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Residual Impacts for Each Structure Type (miles crossed)																		Overall Residual Impacts on Structures (miles crossed)		
		Building (Non-residence)		Other		Residential		Rest Stop		Mining/ Extraction		Outstructure		Communication Facility		Power Substation		Windmill				
		None	Low	None	Moderate	None	Moderate	None	Moderate	None	Low	None	Low	None	Low	None	Low	None	Low	None	Low	Moderate
Applicant's Proposed Action	33.8	33.8	0.0	33.8	0.0	33.8	0.0	33.8	0.0	33.8	0.0	33.7	0.1	33.8	0.0	33.8	0.0	33.8	0.0	33.7	0.1	0.0
Variation S2-A1	*2.8*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*3.7*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*3.8*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*12.1*	*0.0*	*12.1*	*0.0*	*12.1*	*0.0*	*12.1*	*0.0*	*12.1*	*0.0*	*12.0*	*0.1*	*12.1*	*0.0*	*12.1*	*0.0*	*12.1*	*0.0*	*12.0*	*0.1*	*0.0*
Variation S2-F2	*12.2*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.1*	*0.1*	*12.2*	*0.0*	*12.1*	*0.1*	*0.0*
Glass Hill	33.7	33.7	0.0	33.7	0.0	33.7	0.0	33.7	0.0	33.7	0.0	33.6	0.1	33.7	0.0	33.7	0.0	33.7	0.0	33.6	0.1	0.0
Variation S2-D1	*4.3*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*	*0.0*
Mill Creek	34.0	34.0	0.0	34.0	0.0	34.0	0.0	34.0	0.0	34.0	0.0	34.0	0.0	34.0	0.0	33.9	0.1	34.0	0.0	33.9	0.1	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 14.6 miles of moderate impacts on existing land uses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These temporary impacts associated with construction could include detouring of roads, removal of fencing, or non-intentional damage to property. In some cases, access to existing forest/woodland or agricultural operations may be periodically hindered in areas where public and employee access is prohibited for safety reasons. Impacts resulting from the operation of the Applicant's Proposed Action Alternative would likely be minimal as agricultural operations could persist adjacent to and within areas of the right-of-way where transmission facilities could span agricultural features. No residual high impacts associated with this alternative would be expected. Refer to Table 3-234 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 2.

Variation S2-A1

Variation S2-A1 would result in 1.6 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-A1 would be expected.

Variation S2-A2

Variation S2-A2 would result in 2.1 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-A2 would be expected.

Variation S2-C1

Variation S2-C1 would result in 6.4 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-C1 would be expected.

Variation S2-C2

Variation S2-C2 would result in 6.1 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-C2 would be expected.

Variation S2-E1

Variation S2-E1 would result in 1.6 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-E1 would be expected.

Variation S2-E2

Variation S2-E2 would result in 1.4 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-E2 would be expected.

Variation S2-F1

Variation S2-F1 would result in 1.2 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-F1 would be expected.

Variation S2-F2

Variation S2-F1 would result in 1.2 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-F2 would be expected.

Glass Hill Alternative

The Glass Hill Alternative would result in 13.4 miles of moderate impacts on existing land uses where the reference centerline of the route crosses forest/woodland and agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-F1 would be expected. Refer to Table 3-234 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 2.

Variation S2-D1

Variation S2-D1 would result in 3.7 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-D1 would be expected.

Variation S2-D2

Variation S2-D2 would result in 3.2 miles of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with Variation S2-D2 would be expected.

Mill Creek Alternative

The Glass Hill Alternative would result in 10.9 miles of moderate impacts on existing land uses where the reference centerline of the route crosses forest/woodland and agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No residual high impacts associated with the Mill Creek Alternative would be expected. Refer to Table 3-234 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 2.

Conclusions

In Segment 2, no residual high impacts are anticipated on existing land uses for any alternative routes or variations. Moderate residual impacts associated with Segment 1 alternatives would occur where the reference centerline crosses agricultural or forested/woodland areas. Estimated moderate effects range from 33.7 miles (Glass Hill Alternative) to 34.0 miles (Mill Creek Alternative); and, miles crossed of existing land uses that would result in moderate residual impacts range from approximately 10.9 miles (Mill Creek Alternative) to 14.6 miles (Applicant's Proposed Action Alternative). The alternative routes are comparable in length. Among the alternative routes considered, the Mill Creek Alternative would result in the least amount of moderate residual impacts on existing land uses.

Timber Management

Applicant's Proposed Action Alternative

All of the potential impacts on timber management presented in Section 3.2.6.1 could occur wherever forested lands are crossed by the Applicant's Proposed Action Alternative in Segment 2. These impacts can be summarized as a potential loss of harvestable timber, a loss of future timber revenue, and potential constraints on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

Table 3-235 provides miles crossed of forested lands on each alternative route in Segment 2. Impacts on lands administered by the USFS would be evaluated under the management direction in the LRMP. Impacts on forested private lands would vary with the landowner and their individual concerns. The Applicant will negotiate with the landowner regarding compensation for timber values lost or reduced as a result of the B2H Project.

Goal 4 of the Oregon Statewide Local Planning Goals includes the following requirements for siting transmission lines on forested lands:

- The proposed use must not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands.
- The proposed use must not significantly increase fire hazard or significantly increase fire-suppression costs or significantly increase risks to fire-suppression personnel.
- The proposed use has the least impact on nearby or adjoining forest or agricultural lands.
- The siting ensures that adverse impacts on forest operations and accepted farming practices on the tract will be minimized.
- The amount of forest lands used to site access roads, service corridors, and structures is minimized.
- The risks associated with wildfire are minimized.

The B2H Project would be compatible with Power Transportation Facilities Management Area (Management Area 17) where it passed through the Wallowa-Whitman National Forest utility corridor identified for transport of gas, oil and electricity (USFS 1990). For areas outside of this USFS utility corridor, the Applicant would ensure that significant changes in cost or forest practices do not result

from the B2H Project through establishment of right-of-way fees and compensation to landowners,. Design features of the B2H Project for environmental protection address the requirements to minimize fire hazard, risks to fire-suppression personnel, impacts on forest operations, and the amount of forested lands used for access roads and other components.

Other Alternative Routes and Variations in Segment 2

Potential impacts on timber management on all other alternative routes and variations in Segment 2 would be similar, wherever forested vegetation is crossed.

Conclusions

There is no discernable difference in impacts on timber management among the alternative routes and variations analyzed in Segment 2.

Fire Management

Refer to the discussion in the Effects Common to All Alternatives section.

Conclusions

There is no discernable difference in impacts on fire management among the alternative routes and variations analyzed in Segment 2.

Zoning

The result of the effects analysis for zoning for the alternatives and route variations in Segment 2 are described below in terms of miles crossed of EFU or ERU zones. As discussed in Effects Common to All Alternatives for Zoning there are no identified zones crossed that prohibit the development of the B2H Project facilities; however, in areas where the B2H Project crosses EFU or ERU zones, the Applicant would have to demonstrate necessity as described in Section 3.2.6.2 Regulatory Framework. In all cases the potential effect of not demonstrating necessity could result in non-conformance with Oregon Statewide Planning Goals. Refer to MV-13 for locations of EFU and ERU zoning.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses approximately 4.9 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

None of the route variations for the Applicant's Proposed Action Alternative crosses any EFU zoning, thus no identifiable impacts would occur on property zoned for EFU.

Glass Hill Alternative

The Glass Hill Alternative crosses 4.9 miles of EFU zoning.

Variation S2-D1

The Variation S2-D1 and Variation S2-D2 would not cross any EFU zoning, thus no identifiable impacts would occur on property zoned for EFU.

Mill Creek Alternative

The Glass Hill Alternative crosses 3.0 miles of EFU zoning.

Conclusions

Because the Applicant has elected to demonstrate compliance with statewide planning goals by under Path B, the EFSC would determine whether the project complies with applicable Land Conservation and Development Commission rules and land-use statutes (including statewide planning goals), and any applicable, substantive criteria from each county's local comprehensive plan and land-use regulations. Relevant to zoning, there is no notable difference among alternative routes or variations analyzed in Segment 2. All alternative routes cross similar distances of EFU zones.

Military Training

Table 3-271 describes the MTRs crossed for all Segment 2 alternatives and route variations.

Applicant's Proposed Action Alternative

Potential effects from the Applicant's Proposed Action Alternative would include the potential for restriction of aircraft movement during training operations. In addition the presence of transmission line structures and conductors within special-use airspace would create potential collision hazards with B2H Project facilities.

The project description includes structure-design modification to meet the requirements of NWSTF Boardman and the FAA. Structure-design modification would be effective in meeting NWSTF Boardman's request to limit structure heights to 100 feet or less and allowing NWSTF Boardman to meet their training mission (M. Vaughn, Idaho Power Company, email communication with author, 2016). In addition, structures, conductors, and/or shield wires would be marked with high-visibility devices (i.e., markerballs or other marking devices) where required by NWSTF Boardman and/or FAA.

To determine whether the B2H Project would be a hazard to these operations, the Applicant would conduct an obstruction evaluation/airport airspace analysis in coordination with the FAA. This, along with other required permits, authorizations, and evidence would be provided to the BLM prior to issuance of a Notice to Proceed. The obstruction evaluation/airport airspace analysis would determine whether a transmission line structure or span exceeds or is within the criteria identified by the FAA, refer to Section 3.2.9 for further discussion regarding airport facilities.

In addition, NWSTF Boardman has indicated a preference for colocation of the B2H Project with existing aboveground infrastructure to minimize impacts on existing flight patterns and training operations (M. Vaughn, Idaho Power Company, email communication with author, 2016). Coordination with owners of existing utilities would be necessary during design and construction to avoid conflicts.

Variations S2-A1 and S2-A2

Effects on military training in special-use airspace would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S2-B1, S2-B2, S2-C1, S2-C2, S2-E1, S2-E2, S2-F1, and S2-F2

No other variations cross MTRs; therefore, no effects are anticipated to occur.

Glass Hill Alternative

Effects on military training in special-use airspace would be similar to those described for the Applicant's Proposed Action Alternative; however, a portion of the Glass Hill Alternative is located farther east, Link 2-10.

Variation S2-D1 and Variation S2-D2 would not cross MTRs; therefore, no effects are anticipated to occur from these route variations.

Mill Creek Alternative

Effects on military training in special-use airspace would be the same as those described for the Applicant's Proposed Action Alternative.

Conclusions

Some of the variations of the Applicant's Proposed Action Alternative and Glass Hill Alternative avoid MTRs. However, there is no notable difference in impacts among alternative routes analyzed in Segment 2.

Specially Designated Areas

Table 3-275 presents the miles crossed for specially designated areas for the alternatives and route variations in Segment 2.

Table 3-275. Specially Designated Areas in Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length (miles)	Area of Critical Environmental Concern	Wildlife Area	Research Natural Area
Applicant's Proposed Action	33.8	0.0	0.0	0.0
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*
Glass Hill	33.7	0.0	0.0	0.0
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	0.0	1.0	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative and route variations do not cross any specially designated areas.

Glass Hill Alternative

The Glass Hill Alternative and route variations do not cross any specially designated areas.

Mill Creek Alternative

The Mill Creek Alternative crosses 1.0 mile of the Ladd Marsh Wildlife Area (Link 2-53). The Ladd Marsh Wildlife Area Management Plan does not preclude transmission lines from crossing the wildlife area; however securing an easement across the wildlife area would require coordination with the ODFW. As discussed in the Mitigation Planning and Effectiveness section, application of Mitigation Measures 1, 2, 5, 6, 8, 12, 13, 14, and 15 (refer to Table 2-13) on the resources present in this area would minimize the potential effects of the B2H Project and management of the area for the established objectives would not be precluded. While temporary disturbance to sensitive soils, wildlife, and vegetation during construction is anticipated, it is anticipated the Applicant would coordinate with ODFW to ensure the B2H Project is compatible with the wildlife resources long-term, in accordance with the management plan for this wildlife area. Refer to Section 3.2.4 for further description of potential effects on Ladd Marsh.

Conclusions

The Mill Creek Alternative crosses the Ladd Marsh Wildlife Area. Transmission lines are not precluded from crossing the wildlife area; however securing an easement across the wildlife area would require coordination with the ODFW. There is no discernable difference in impacts among the other alternative routes analyzed in Segment 2.

SEGMENT 3—BAKER VALLEY

Land Ownership, Utility Corridors, and Parallel Facilities

Table 3-276 and Table 3-277 present the miles of land ownership and utility corridors crossed for the alternatives and route variations in Segment 3.

Table 3-276. Land Ownership and Utility Corridors in Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Land Ownership						Utility Corridors		
		Bureau of Land Management	Bureau of Reclamation	Department of Defense	U.S. Forest Service	State	Private	Resource Management Plan	West-Wide Energy Corridor	Percent within Utility Corridor
Applicant's Proposed Action	55.2	15.1	0.0	0.0	0.0	0.0	40.1	0.0	1.4	2.5
Variation S3-A1	*12.4*	*1.3*	*0.0*	*0.0*	*0.0*	*0.0*	*11.1*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*	*11.8*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*5.5*	*0.0*	*0.0*	*0.0*	*0.0*	*8.4*	*0.0*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*0.3*	*0.0*	*0.0*	*0.0*	*0.0*	*14.1*	*0.0*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*14.7*	*0.0*	*0.0*	*0.0*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*14.3*	*0.0*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*0.3*	*0.0*	*0.0*	*0.0*	*0.0*	*13.7*	*0.0*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*7.6*	*0.0*	*0.0*	*0.0*	*0.0*	*13.5*	*0.0*	*1.4*	*6.6*
Variation S3-C2	*21.7*	*5.8*	*0.0*	*0.0*	*0.0*	*0.0*	*15.9*	*0.0*	*2.5*	*11.5*
Variation S3-C3	*21.1*	*5.7*	*0.0*	*0.0*	*0.0*	*0.0*	*15.4*	*0.0*	*1.4*	*6.6*
Variation S3-C4	*21.4*	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*15.4*	*0.0*	*1.4*	*6.5*
Variation S3-C5	*21.0*	*7.2*	*0.0*	*0.0*	*0.0*	*0.0*	*13.8*	*0.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*10.5*	*0.0*	*0.0*	*0.0*	*0.0*	*14.2*	*0.0*	*0.0*	*0.0*
Flagstaff A	55.0	9.9	0.0	0.0	0.0	0.0	45.4	0.0	1.4	2.5
Timber Canyon	70.3	8.4	0.0	0.0	19.7	0.0	42.2	0.0	1.4	2.0
Flagstaff A – Burnt River Mountain	55.3	8.0	0.0	0.0	0.0	0.0	47.3	0.0	1.4	2.5
Flagstaff B	56.0	9.6	0.0	0.0	0.0	0.0	46.4	0.0	1.4	2.5
Flagstaff B – Burnt River West	55.7	8.3	0.0	0.0	0.0	0.0	47.4	0.0	0.0	0.0
Flagstaff B – Durkee	59.6	12.5	0.0	0.0	0.0	0.0	47.1	0.0	0.0	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses private lands (40.1 miles). Other jurisdictions crossed include BLM-administered lands (15.1 miles).

This alternative is not located within a designated utility corridor. The Applicant's Proposed Action Alternative is colocated (within 300 feet from centerline) with an existing 138-kV transmission line for approximately 11 miles. This alternative also is sited parallel (within 300 to 2,000 feet from route centerline) to a 230-kV transmission line (13.8 miles) a 69-kV transmission line (10 miles), and roadway facilities (36 miles).

Table 3-277. Parallel Facilities in Segment 3—Baker Valley																		
Alternative Route	Total Length (miles)	Parallel Linear Facilities (within 300 feet of reference centerline) (miles)							Parallel Linear Facilities (from 300 feet to 2,000 feet from reference centerline) (miles)							Total Miles Parallel Linear Facilities (within 300 feet)	Total Miles Parallel Linear Facilities (from 300 to 2,000 feet)	Total Number of Linear Facility Crossings
		69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads	69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads			
Applicant's Proposed Action	55.2	3.1	0.0	11.4	0.5	0.0	0.1	6.9	10.9	0.0	6.5	13.9	0.0	2.0	36.1	20.2	28.4	59
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.9*	*0.0*	*0.0*	*0.0*	*12.3*	*0.0*	*0.0*	*8.2*	*1.9*	*10.4*	*10*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*11.6*	*0.0*	*0.0*	*1.5*	*0.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.0*	*8.3*	*11.6*	*0.6*	*8*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.5*	*0.0*	*0.0*	*1.7*	*0.3*	*0.0*	*0.4*	*1.6*	*0.0*	*0.0*	*9.0*	*2.1*	*9.2*	*12*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*2.3*	*1.7*	*0.0*	*0.0*	*2.7*	*3.0*	*0.0*	*1.0*	*7.5*	*0.0*	*0.0*	*7.5*	*5.4*	*8.6*	*16*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*3.3*	*4.2*	*0.0*	*0.0*	*2.8*	*3.7*	*0.0*	*0.4*	*5.4*	*0.0*	*0.1*	*8.0*	*8.9*	*5.5*	*16*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*3.3*	*5.5*	*0.0*	*0.0*	*2.3*	*3.7*	*0.0*	*0.4*	*5.5*	*0.0*	*0.1*	*8.4*	*9.5*	*4.8*	*14*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*2.3*	*0.8*	*0.0*	*0.0*	*1.9*	*3.0*	*0.0*	*1.0*	*8.8*	*0.0*	*0.0*	*7.8*	*3.9*	*9.5*	*12*
Variation S3-C1	*21.1*	*0.5*	*0.0*	*7.9*	*0.0*	*0.0*	*0.1*	*2.8*	*9.4*	*0.0*	*2.0*	*0.0*	*0.0*	*2.0*	*14.0*	*10.3*	*7.1*	*29*
Variation S3-C2	*21.7*	*3.9*	*0.0*	*10.0*	*0.0*	*0.0*	*0.1*	*3.3*	*8.6*	*0.0*	*2.3*	*0.0*	*0.0*	*2.0*	*14.4*	*13.3*	*5.0*	*35*
Variation S3-C3	*21.1*	*0.6*	*0.0*	*8.2*	*0.0*	*0.0*	*1.2*	*2.2*	*5.7*	*0.0*	*3.1*	*0.0*	*0.0*	*7.1*	*12.2*	*10.6*	*6.2*	*36*
Variation S3-C4	*21.4*	*0.6*	*0.0*	*8.2*	*0.0*	*0.0*	*1.1*	*2.6*	*5.7*	*0.0*	*3.1*	*0.0*	*0.0*	*6.6*	*12.1*	*10.9*	*6.2*	*39*
Variation S3-C5	*21.0*	*0.2*	*0.0*	*0.3*	*0.0*	*0.0*	*0.1*	*1.6*	*1.4*	*0.0*	*1.8*	*0.0*	*0.0*	*0.7*	*9.5*	*2.2*	*9.3*	*15*
Variation S3-C6	*24.7*	*0.2*	*0.0*	*0.3*	*0.0*	*0.0*	*0.1*	*2.8*	*1.4*	*0.0*	*1.3*	*0.0*	*0.0*	*0.8*	*9.9*	*3.4*	*9.8*	*22*
Flagstaff A	55.3	3.1	0.0	13.7	0.8	0.0	0.1	7.1	13.6	0.0	7.2	21.1	0.0	2.0	34.9	22.1	28.7	59
Timber Canyon	70.3	0.5	0.0	4.3	0.3	0.0	0.1	11.8	5.0	0.0	0.5	1.4	0.0	2.0	45.0	16.3	40.8	86
Flagstaff A – Burnt River Mountain	55.3	3.2	0.0	13.9	0.8	0.0	1.2	6.5	10.0	0.0	8.4	21.1	0.0	7.1	33.1	22.4	27.8	66
Flagstaff B	55.9	3.1	0.0	14.7	4.2	0.0	0.1	8.0	14.3	0.0	6.5	17.7	0.0	2.1	35.0	27.1	24.6	63
Flagstaff B – Burnt River West	56.0	2.8	0.0	7.1	15.8	0.0	0.1	6.4	6.3	0.0	6.3	6.0	0.0	0.8	30.7	28.7	17.1	47
Flagstaff B – Durkee	55.7	2.8	0.0	7.1	4.2	0.0	0.1	8.0	6.3	0.0	5.9	17.7	0.0	0.9	31.0	20.3	27.3	56

Variation S3-A1

Variation S3-A1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation is not located within a designated utility corridor.

Variation S3-A1 is parallel (within 300 to 2,000 feet) to an existing 230-kV transmission line for approximately 12 miles.

Variation S3-A2

Variation S3-A2 crosses predominately private lands (11.1 miles). This variation is not located within a designated utility corridor.

Variation S3-A2 was developed to be colocated with an existing 230-kV transmission line for 12 miles.

Variation S3-B1

Variation S3-B1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation crosses both private (8.4 miles) and BLM (5.5 miles) lands and is not located within a utility corridor.

Approximately 9 miles of Variation S3-B1 is sited parallel (300 to 2,000 feet from route centerline) to an existing 138-kV transmission line and Interstate 84.

Variation S3-B2

Variation S3-B2 shares a portion of the same alignment as the Flagstaff B Alternative. This variation crosses predominately private land (14.1 miles) and is not located within a designated utility corridor.

Small portions of Variation S3-B2 are colocated (within 300 feet) with existing transmission lines. Approximately 8 miles of Variation S3-B2 is sited parallel (300 to 2,000 feet from route centerline) to an existing 230-kV transmission line.

Variation S3-B3

Variation S3-B3 shares a portion of the same alignment as the Flagstaff B Alternative. This variation crosses solely private land (14.8 miles) and is not located within a designated utility corridor.

Variation S3-B2 are colocated (within 300 feet) with existing 230-kV transmission line (4.2 miles) and a 138-kV transmission line (3.3 miles). Approximately 8 miles of Variation S3-B3 is sited parallel to existing roadway facilities (300 to 2,000 feet from route centerline).

Variation S3-B4

Variation S3-B4 shares a portion of the same alignments as Flagstaff A and B. This variation crosses solely private land (14.2 miles) and is not located within a utility corridor.

This variation is colocated (within 300 feet of variation centerline) with both an existing 230-kV transmission line (4 miles) and a 138-kV transmission line (3.3 miles). Approximately 8 miles of Variation S3-B4 is sited parallel to existing roadway facilities (300 to 2,000 feet from route centerline).

Variation S3-B5

Variation S3-B5 shares a portion of the same alignments as Flagstaff A and crosses predominately private land (13.7 miles). This variation is not located within a utility corridor.

Variation S3-B5 is sited parallel (within 300 to 2,000 feet from variation centerline) to an existing 230-kV transmission line (8.8 miles) and a 69-kV transmission line (2.9 miles). In addition, approximately 7.7 miles of Variation S3-B5 is sited parallel to existing roadway facilities.

Variation S3-C1

Variation S3-C1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation crosses private land (13.5 miles) and BLM-administered land (7.6 miles) and is not located within a designated utility corridor.

Variation S3-C1 is colocated with an existing 138-kV transmission line for approximately 7 miles.

Variation S3-C2

Variation S3-C shares the same alignment as the Applicant's Proposed Action Alternative. This variation crosses private land (15.9 miles) and BLM-administered land (5.8 miles) and is not located within a designated utility corridor.

This variation is colocated (within 300 feet) with an existing 138-kV transmission line for about 10 miles and an existing 69-kV transmission line for approximately 4 miles.

Variation S3-C3

Variation S3-C3 shares the same alignment as the Applicant's Proposed Action Alternative. This variation crosses private land (15.9 miles) and BLM-administered land (5.8 miles) and is not located within a designated utility corridor.

This variation is colocated (within 300 feet) with an existing 138-kV transmission line for about 8 miles and an existing 69-kV transmission line for approximately 1 mile.

Variation S3-C4

Variation S3-C4 shares the same alignment as the Variation S3-C4 except for about 3 miles. Variation S3-C4 crosses private land (15.4 miles) and BLM-administered land (6 miles) and is not located within a designated utility corridor.

This variation is colocated (within 300 feet) with an existing 138-kV transmission line for approximately 8 miles and an existing 69-kV transmission line for approximately 1 mile.

Variation S3-C5

Variation S3-C5 shares the same alignment as the Variation S3-C4 except for about 3 miles. Variation S3-C5 crosses private land (15.4 miles) and BLM-administered land (6 miles) and is not located within a designated utility corridor.

This variation is sited parallel to (300 to 2,000 feet from variation centerline) existing roadway facilities for approximately 9 miles.

Variation S3-C6

Variation S3-C6 crosses private land (14.2 miles) and BLM-administered land (10.5 miles) and is not located within a designated utility corridor.

This variation is sited parallel to (300 to 2,000 feet from variation centerline) existing roadway facilities for approximately 9 miles.

Flagstaff A Alternative

The Flagstaff A Alternative crosses private land (45.4 miles) and BLM-administered land (9.9 miles) and is not located within a designated utility corridor.

The Flagstaff A Alternative was developed to provide more opportunity for colocation with existing utilities than the Applicant's Proposed Action Alternative. The Flagstaff A Alternative is colocated (within 300 feet of alternative centerline) with the 230-kV transmission line for 13 miles and is parallel (within 300 to 2,000 feet) of an existing 230-kV and 138-kV transmission lines. Flagstaff A Alternative also is sited parallel to existing roadway facilities for approximately 22 miles.

Timber Canyon Alternative

The Timber Canyon Alternative crosses private land (42.2 miles), USFS land (19.7 miles) and BLM-administered land (8.4 miles), and is not located within a designated utility corridor.

The southern section of the Timber Canyon Alternative is sited parallel (300 to 2,000 feet) to Interstate 84 for approximately 4 miles and numerous other road facilities for approximately 45 miles, Table 3-277. Selection of the Timber Canyon Alternative would not be consistent with the USFS Wallowa-Whitman National Forest LRMP to follow designated corridors or existing utility rights-of-way to the extent practical.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative crosses private land (47.3 miles) and BLM-administered land (8 miles) and is not located within a designated utility corridor.

The Flagstaff A – Burnt River Mountain Alternative is colocated (within 300 feet of alternative centerline) with the 230-kV transmission line for 13.9 miles and a 69-kV transmission line for 3 miles. This alternative also is parallel to (within 300 to 2,000 feet) an existing 230-kV (21 miles) and 138-kV (8 miles) and 69-kV (9.9 miles) transmission lines. In addition, the Flagstaff A – Burnt River Mountain Alternative also is sited parallel to existing roadway facilities for approximately 33 miles.

Flagstaff B Alternative

The Flagstaff B Alternative was developed to avoid private and agricultural lands. This alternative crosses private land (46.4 miles) and BLM-administered land (9.6 miles). This alternative is not located in a designated utility corridor.

Flagstaff B Alternative provides similar opportunity for colocation as the Flagstaff B Burnt River West Alternative. The Flagstaff B Alternative is colocated (within 300 feet of alternative centerline) with the 230-kV transmission line (4.2 miles), a 138-kV transmission line (14.7 miles) and a 69-kV transmission

line (3 miles). This alternative also is located is parallel (within 300 to 2,000 feet) of existing 230-kV (5.9 miles) and 138-kV (6.3 miles) and 69-kV (6.3 miles) transmission lines. In addition, the Flagstaff B Alternative also is sited parallel to existing roadway facilities for approximately 35 miles.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative crosses private land (47.4 miles) and BLM-administered land (8.3 miles). This alternative is not located in a designated utility corridor.

The Flagstaff B – Burnt River West Alternative provides similar opportunity for colocation as the Flagstaff B Alternative. The Flagstaff B – Burnt River West Alternative is colocated (within 300 feet of alternative centerline) with the 230-kV transmission line (15.8 miles), a 138-kV transmission line (7.1 miles) and a 69-kV transmission line (2.7 miles). This alternative also is located is parallel (within 300 to 2,000 feet) of existing 230-kV (17.7 miles) and 138-kV (6.5 miles) and 69-kV (14.3 miles) transmission lines. In addition, the Flagstaff B – Burnt River West Alternative also is sited parallel to existing roadway facilities for approximately 31 miles.

Flagstaff B – Durkee

The Flagstaff B – Durkee Alternative crosses private land (47.1 miles) and BLM-administered land (12.5 miles). This alternative is not located in a designated utility corridor.

The Flagstaff B – Durkee Alternative provides less opportunity for colocation than the other Flagstaff B alternatives. This alternative is colocated (within 300 feet of alternative centerline) with the 230-kV transmission line (4.2 miles), a 138-kV transmission line (7.1 miles) and a 69-kV transmission line (2.7 miles). This alternative also is located is parallel (within 300 to 2,000 feet) of existing 230-kV (17.7 miles) and 138-kV (5.9 miles) and 69-kV (6.9 miles) transmission lines. In addition, the Flagstaff B – Durkee Alternative also is sited parallel to existing roadway facilities for approximately 31 miles.

Conclusions

The reference centerlines of alternative routes in Segment 3 cross primarily private lands and some federal lands. The percentage of federal lands crossed by Segment 3 alternative routes ranges from 14.5 percent (Flagstaff A—Burnt River Mountain) to 40.0 percent (Timber Canyon Alternative). The use of designated utility corridors is similar among the alternative routes. The number of miles of parallel linear facilities within 2,000 feet of Segment 3 alternatives range from 45.8 miles (Flagstaff B—Burnt River West) to 57.1 miles (Timber Canyon Alternative). The Timber Canyon Alternative crosses the most federal lands, and would parallel more existing linear facilities (due to proximity to existing roadways) compared to other Segment 3 alternative routes.

Existing Land Use

Table 3-278 and Table 3-279 present the residual impacts on existing land use types and structures for all alternative routes and route variations in Segment 3. For locations of residual impacts described below, refer to MV-12.

Table 3-278. Existing Land Use Inventory Data and Overall Residual Impacts for Segment 3—Baker Valley

Alternative Route	Total Length (Miles)	Resource Inventory for Existing Land Use GAP Types (miles crossed)						Overall Residual Impacts for Existing Land Use GAP Types (miles crossed)		
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland	None	Low	Moderate
Applicant's Proposed Action	55.2	0.7	0.3	0.2	0.0	3.5	50.5	0.0	54.3	0.9
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*11.9*	*0.0*	*12.4*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*11.7*	*0.0*	*12.2*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.1*	*0.0*	*0.7*	*13.1*	*0.0*	*13.9*	*0.0*
Variation S3-B2	*14.4*	*1.1*	*0.0*	*0.1*	*0.3*	*0.0*	*12.9*	*0.0*	*13*	*1.4*
Variation S3-B3	*14.7*	*1.1*	*0.0*	*0.1*	*0.3*	*0.2*	*13.0*	*0.0*	*13.3*	*1.4*
Variation S3-B4	*14.3*	*2.3*	*0.0*	*0.0*	*0.3*	*0.2*	*11.5*	*0.0*	*11.7*	*2.6*
Variation S3-B5	*14.0*	*2.3*	*0.0*	*0.0*	*0.3*	*0.1*	*11.3*	*0.0*	*11.4*	*2.6*
Variation S3-C1	*21.1*	*0.7*	*0.3*	*0.1*	*0.0*	*2.0*	*18.0*	*0.0*	*20.2*	*0.9*
Variation S3-C2	*21.7*	*0.7*	*0.3*	*0.3*	*0.0*	*2.0*	*18.4*	*0.0*	*20.8*	*0.9*
Variation S3-C3	*21.1*	*1.0*	*0.3*	*0.3*	*0.8*	*1.9*	*16.8*	*0.0*	*19.1*	*2.0*
Variation S3-C4	*21.4*	*0.7*	*0.5*	*0.3*	*0.8*	*2.1*	*17.0*	*0.0*	*19.7*	*1.7*
Variation S3-C5	*21.0*	*0.2*	*0.6*	*0.1*	*1.9*	*3.4*	*14.8*	*0.0*	*18.9*	*2.1*
Variation S3-C6	*24.7*	*0.2*	*0.7*	*0.1*	*4.1*	*3.3*	*16.3*	*0.0*	*20.4*	*4.3*
Flagstaff A	55.3	3.0	0.3	0.1	0.3	2.9	48.7	0.0	51.8	3.5
Timber Canyon	70.3	2.2	0.2	0.2	25.2	4.5	38.0	0.0	42.7	27.6
Flagstaff A – Burnt River Mountain	55.3	3.3	0.3	0.3	1.1	2.8	47.5	0.0	50.7	4.6
Flagstaff B	56.0	1.8	0.3	0.2	0.3	3.0	50.4	0.0	53.7	2.3
Flagstaff B – Burnt River West	55.7	1.3	0.6	0.2	2.2	4.4	47.0	0.0	52.2	3.5
Flagstaff B – Durkee	59.6	1.3	0.7	0.2	4.4	4.3	48.7	0.0	53.9	5.7

Table 3-279. Residual Impacts for Existing Land Use Structures for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Residual Impacts for Existing Land Use Structures																		Overall Residual Impacts on Structures (miles crossed)		
		Building (Non-residence)		Other		Residential		Rest Stop		Mining/ Extraction		Outstructure		Communication Facility		Power Substation		Windmill				
		None	Low	None	`Moderate	None	Moderate	None	Moderate	None	Low	None	Low	None	Low	None	Low	None	Low	None	Low	Moderate
Applicant's Proposed Action	55.2	55.2	0.0	55.2	0.0	55.0	0.2	55.2	0.0	55.1	0.1	54.9	0.3	55.2	0.0	55.2	0.0	55.2	0.0	54.6	0.4	0.2
Variation S3-A1	*12.4*	*12.4*	*0.0*	*12.4*	*0.0*	*12.4*	*0.0*	*12.4*	*0.0*	*12.4*	*0.0*	*12.2*	*0.2*	*12.4*	*0.0*	*12.4*	*0.0*	*12.4*	*0.0*	*12.2*	*0.2*	*0.0*
Variation S3-A2	*12.2*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*14.7*	*0.0*	*14.7*	*0.0*	*14.7*	*0.0*	*14.7*	*0.0*	*14.6*	*0.1*	*14.7*	*0.0*	*14.7*	*0.0*	*14.7*	*0.0*	*14.7*	*0.0*	*14.6*	*0.1*	*0.0*
Variation S3-B4	*14.3*	*14.3*	*0.0*	*14.3*	*0.0*	*14.3*	*0.0*	*14.3*	*0.0*	*14.2*	*0.1*	*14.1*	*0.2*	*14.3*	*0.0*	*14.3*	*0.0*	*14.3*	*0.0*	*14.0*	*0.3*	*0.0*
Variation S3-B5	*14.0*	*14.0*	*0.0*	*14.0*	*0.0*	*14.0*	*0.0*	*14.0*	*0.0*	*14.0*	*0.0*	*13.6*	*0.4*	*14.0*	*0.0*	*14.0*	*0.0*	*14.0*	*0.0*	*13.6*	*0.4*	*0.0*
Variation S3-C1	*21.1*	*21.1*	*0.0*	*21.1*	*0.0*	*20.9*	*0.2*	*21.1*	*0.0*	*21.0*	*0.1*	*21.0*	*0.1*	*21.1*	*0.0*	*21.1*	*0.0*	*21.1*	*0.0*	*20.7*	*0.2*	*0.2*
Variation S3-C2	*21.7*	*21.7*	*0.0*	*21.7*	*0.0*	*21.5*	*0.2*	*21.7*	*0.0*	*21.6*	*0.1*	*21.6*	*0.1*	*21.7*	*0.0*	*21.7*	*0.0*	*21.7*	*0.0*	*21.3*	*0.2*	*0.2*
Variation S3-C3	*21.1*	*21.0*	*0.1*	*21.1*	*0.0*	*20.8*	*0.3*	*21.1*	*0.0*	*20.8*	*0.3*	*20.9*	*0.2*	*21.1*	*0.0*	*21.1*	*0.0*	*21.1*	*0.0*	*20.4*	*0.4*	*0.3*
Variation S3-C4	*21.4*	*21.3*	*0.1*	*21.4*	*0.0*	*21.1*	*0.3*	*21.4*	*0.0*	*21.1*	*0.3*	*21.2*	*0.2*	*21.4*	*0.0*	*21.4*	*0.0*	*21.4*	*0.0*	*20.7*	*0.4*	*0.3*
Variation S3-C5	*21.0*	*21.0*	*0.0*	*21.0*	*0.0*	*21.0*	*0.0*	*21.0*	*0.0*	*21.0*	*0.0*	*20.9*	*0.1*	*21.0*	*0.0*	*21.0*	*0.0*	*21.0*	*0.0*	*20.9*	*0.1*	*0.0*
Variation S3-C6	*24.7*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*0.0*
Flagstaff A	55.3	55.3	0.0	55.3	0.0	55.1	0.2	55.3	0.0	55.2	0.1	54.6	0.7	55.3	0.0	55.3	0.0	55.3	0.0	54.3	0.8	0.2
Timber Canyon	70.3	70.1	0.2	70.3	0.0	69.5	0.8	70.3	0.0	70.2	0.1	69.7	0.6	70.2	0.1	70.3	0.0	70.3	0.0	69.1	0.4	0.8
Flagstaff A – Burnt River Mountain	55.3	55.2	0.1	55.3	0.0	55.0	0.3	55.3	0.0	55.0	0.3	54.5	0.8	55.3	0.0	55.3	0.0	55.3	0.0	54.0	1.0	0.3
Flagstaff B	56.0	56.0	0.0	56.0	0.0	55.8	0.2	56.0	0.0	55.8	0.2	55.7	0.3	56.0	0.0	56.0	0.0	56.0	0.0	55.3	0.5	0.2

Table 3-279. Residual Impacts for Existing Land Use Structures for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Residual Impacts for Existing Land Use Structures																		Overall Residual Impacts on Structures (miles crossed)		
		Building (Non-residence)		Other		Residential		Rest Stop		Mining/ Extraction		Outstructure		Communication Facility		Power Substation		Windmill				
		None	Low	None	`Moderate	None	Moderate	None	Moderate	None	Low	None	Low	None	Low	None	Low	None	Low	None	Low	Moderate
Flagstaff B – Burnt River West	55.7	55.7	0.0	55.7	0.0	55.7	0.0	55.7	0.0	55.6	0.1	55.6	0.1	55.7	0.0	55.7	0.0	55.7	0.0	55.5	0.2	0.0
Flagstaff B – Durkee	59.6	59.6	0.0	59.6	0.0	59.6	0.0	59.6	0.0	59.5	0.1	59.4	0.2	59.6	0.0	59.6	0.0	59.6	0.0	59.3	0.3	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 0.7 mile of moderate impacts on existing land uses where the reference centerline of the route crosses agricultural areas that could result in short-term conflicts with agricultural production. These temporary impacts associated with construction could include detouring of roads, removal of fencing, or non-intentional damage to property. In some cases, access to existing commercial or agricultural operations may be periodically hindered in areas where public and employee access is prohibited for safety reasons. Impacts resulting from the operation of the Applicant's Proposed Action Alternative would likely be minimal as agricultural operations could persist adjacent to and within areas of the right-of-way where transmission facilities could span agricultural features. No residual high impacts associated with Applicant's Proposed Action Alternative would be expected. Refer to Table 3-241 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 3.

Variations S3-A1, S3-A2, and S3-B1

No moderate or high impacts would occur with the construction and operation of these variations.

Variations S3-B2 and S3-B3

Variations S3-B2 and S3-B3 would result in 1.4 miles of moderate impacts on existing land uses where the reference centerline crosses agricultural and forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with these variations would be expected.

Variations S3-B4 and S3-B5

Variations S3-B4 and S3-B5 would result in 2.6 miles of moderate impacts on existing land uses where the reference centerline crosses agricultural and forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with these variations would be expected.

Variation S3-C1

Variation S3-C1 would result in 0.7 mile of moderate impacts on existing land uses where the reference centerline crosses agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with this variation would be expected.

Variation S3-C2

Variation S3-C2 would result in 0.9 mile of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the variation crosses agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with this variation would be expected.

Variation S3-C3

Variation S3-C3 would result in 2.0 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the variation crosses forest/woodland

and agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with this variation would be expected.

Variation S3-C4

Variation S3-C4 would result in 1.7 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the variation crosses forest/woodland and agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with this variation would be expected.

Variation S3-C5

Variation S3-C5 would result in 2.1 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the variation crosses forest/woodland and agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with this variation would be expected.

Variation S3-C6

Variation S3-C6 would result in 4.3 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the variation crosses forest/woodland and agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with this variation would be expected.

Flagstaff A Alternative

Flagstaff A Alternative would result in 3.5 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 3. No high impacts associated with this alternative would be expected. Refer to Table 3-241 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 3.

Timber Canyon Alternative

Timber Canyon Alternative would result in 27.6 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 3. No high impacts associated with this alternative would be expected. Refer to Table 3-241 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 3.

Flagstaff A – Burnt River Mountain Alternative

Flagstaff A – Burnt River Mountain Alternative would result in 4.6 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural

production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 3. No high impacts associated with this alternative would be expected. Refer to Table 3-241 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 3.

Flagstaff B Alternative

Flagstaff B Alternative would result in 2.3 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 3. No high impacts associated with this alternative would be expected. Refer to Table 3-241 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 3.

Flagstaff B – Burnt River West Alternative

Flagstaff B – Burnt River West Alternative would result in 3.5 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 3. No high impacts associated with this alternative would be expected. Refer to Table 3-241 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 3.

Flagstaff B – Durkee

Flagstaff B – Durkee Alternative would result in 5.7 miles of moderate impacts on existing land uses where the reference centerline crosses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 3. No high impacts associated with this alternative would be expected. Refer to Table 3-241 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 3.

Conclusions

In Segment 3, no high residual impacts are anticipated on existing land. Moderate residual impacts associated would occur where the Project would cross agricultural or forested/woodland areas. The lengths of the alternative routes in the segment range from 55.2 miles (Applicant's Proposed Action Alternative) to 70.3 miles (Timber Canyon Alternative). Overall, the moderate residual impacts on existing land uses would range from 0.9 mile (Applicant's Proposed Action Alternative) to 27.6 miles (Timber Canyon Alternative). Considering the overall length of an alternative route and the extent of moderate residual impacts, the Applicant's Proposed Action Alternative would have the least effects on existing land uses among the Segment 3 alternative routes. There notable difference in impacts on

existing land uses among variations with regard to impacts on existing land uses for Segment 3 alternatives.

Timber Management

Applicant's Proposed Action Alternative

No forested lands are crossed by the Applicant's Proposed Action in Segment 3.

Other Alternative Routes and Variations in Segment 3

All of the potential impacts on timber management presented in Section 3.2.6.1 could occur wherever forested lands are crossed by alternative routes and variations in Segment 3. These impacts can be summarized as a potential loss of harvestable timber, a loss of future timber revenue, and potential constraints on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

Table 3-242 provides miles crossed of forested lands on each alternative route in Segment 3. Impacts on lands administered by the USFS would be evaluated under the management direction in the LRMP. Impacts on forested private lands would vary with the landowner and their individual concerns. The Applicant will negotiate with the landowner regarding compensation for timber values lost or reduced as a result of the B2H Project.

Goal 4 of the Oregon Statewide Local Planning Goals includes the following requirements for siting transmission lines on forested lands:

- The proposed use must not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands.
- The proposed use must not significantly increase fire hazard or significantly increase fire-suppression costs or significantly increase risks to fire-suppression personnel.
- The proposed use has the least impact on nearby or adjoining forest or agricultural lands.
- The siting ensures that adverse impacts on forest operations and accepted farming practices on the tract will be minimized.
- The amount of forest lands used to site access roads, service corridors, and structures is minimized.
- The risks associated with wildfire are minimized.

Through right-of-way fees and compensation to landowners, the Applicant would ensure that significant changes in cost or forest practices do not result from the B2H Project. Design features of the B2H Project for environmental protection address the requirements to minimize fire hazard, risks to fire-suppression personnel, impacts on forest operations, and the amount of forested lands used for access roads and other components.

Timber Canyon Alternative

The Timber Canyon Alternative crosses approximately 20.6 miles of forested lands, primarily Mixed Conifer Forest. In addition to the potential impacts discussed under Other Alternative Routes and

Variations in Segment 3, the Timber Canyon Alternative crosses timber management areas in the Wallowa-Whitman National Forest.

The 360 acres of forest in the Wallowa-Whitman Forest Plan timber management areas that would be removed from the timber base due to right-of-way clearing and maintenance would not be large enough to affect the programmed harvest level for the Wallowa-Whitman National Forest. As a result, long-term effects on timber management would be minimal for the Timber Canyon Alternative.

Conclusions

The Timber Canyon Alternative is the only alternative route variation within Segment 3 that crosses forested lands. Thus, impacts on timber management would only occur in association with the Timber Canyon Alternative in Segment 3.

Fire Management

Refer to the discussion in the Effects Common to All Alternatives section.

Conclusions

There is no discernable difference in impacts on fire management among the alternative routes and variations analyzed in Segment 3.

Zoning

The result of the effects analysis for zoning for the alternatives and route variations in Segment 3 are described below in terms of miles crossed of EFU or ERU zones. As discussed in Effects Common to All Alternatives for Zoning there are no identified zones crossed that prohibit the development of the B2H Project facilities; however, in areas where the B2H Project crosses EFU or ERU zones, the Applicant would have to demonstrate necessity as described in Section 3.2.6.2 Regulatory Framework. In all cases the potential effect of not demonstrating necessity could result in non-conformance with Oregon Statewide Planning Goals. Refer to MV-14 for locations of EFU and ERU zoning.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses approximately 55.2 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-A1

The Variation S3-A1 crosses approximately 12.4 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-A2

The Variation S3-A2 crosses approximately 12.2 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-B1

The Variation S3-B1 crosses approximately 13.9 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-B2

The Variation S3-B2 crosses approximately 14.4 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-B3

The Variation S3-B3 crosses approximately 14.7 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-B4

The Variation S3-B4 crosses approximately 14.3 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-B5

The Variation S3-B5 crosses approximately 14.0 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-C1

The Variation S3-C1 crosses approximately 21.1 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-C2

The Variation S3-C2 crosses approximately 21.7 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-C3

The Variation S3-C3 crosses approximately 21.1 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-C4

The Variation S3-C4 crosses approximately 21.4 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-C5

The Variation S3-C5 crosses approximately 21.0 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S3-C6

The Variation S3-C6 crosses approximately 23.5 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Flagstaff A Alternative

The Flagstaff A Alternative crosses approximately 55.3 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Timber Canyon Alternative

The Timber Canyon Alternative crosses approximately 38.0 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative crosses approximately 55.3 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Flagstaff B Alternative

The Flagstaff B Alternative crosses approximately 56 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative crosses approximately 55.7 miles of EFU zoning.

Flagstaff B – Durkee

The Flagstaff B – Durkee Alternative crosses approximately 58.4 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Conclusions

Because the Applicant has elected to demonstrate compliance with statewide planning goals by under Path B, the EFSC would determine whether the project complies with applicable Land Conservation and Development Commission rules and land-use statutes (including statewide planning goals), and any applicable, substantive criteria from each county's local comprehensive plan and land-use regulations. There is no notable difference among Segment 3 alternative routes or variations with regard to zoning.

Military Training

Table 3-276 describes the MTRs crossed for the alternatives and route variations in Segment 3.

Applicant's Proposed Action Alternative

The types of impacts on military training in special-use airspace would be similar to those described for the Applicant's Proposed Action Alternative for Segment 2. However, the Applicant's Proposed Action Alternative and alternative routes would crosses more miles within Segment 3, see Table 3-238.

Variations S3-C1 through S3-C6

Effects on military training in special-use airspace would be the same as those described for the Applicant's Proposed Action Alternative.

Variations S3-A1, S3-A2, and S3-B1 through S3-B5

No other route variations for the Applicant's Proposed Action Alternative cross MTRs, and, therefore, no identifiable impacts are anticipated to occur.

Flagstaff A Alternative

Effects on military training in special-use airspace from the Flagstaff A Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

Effects on military training in special-use airspace from the Timber Canyon Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff A – Burnt River Mountain Alternative

Effects on military training in special-use airspace from the Flagstaff A Burnt River Mountain Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

Effects on military training in special-use airspace from the Flagstaff B Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

Effects on military training in special-use airspace from the Flagstaff B- Burnt River West Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

Effects on military training in special-use airspace from the Flagstaff B – Durkee Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Conclusions

There is no discernable difference in impacts on military training among the alternative routes analyzed in Segment 3.

Specially Designated Areas

There are no specially designated areas crossed by any alternative or route variation in Segment 3. Although the Oregon National Historic Trail ACEC (multiple parcels) is located in the 1-mile-wide study corridor in this segment, it is not located within the 250 foot right-of-way. No activities associated with the project would occur within the ACEC, thus, it is not anticipated that this area would be affected by the B2H Project.

Conclusions

There is no discernable difference in impacts on specially designated areas among the alternative routes analyzed in Segment 3.

SEGMENT 4—BROGAN

Land Ownership, Utility Corridors, and Parallel Facilities

Table 3-280 and Table 3-281 present the miles of land ownership, utility corridors, and parallel facilities crossed for the alternatives and route variations in Segment 4.

Table 3-280. Land Ownership and Utility Corridors Inventory Data and Residual Impacts for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Land Ownership						Utility Corridors		
		Bureau of Land Management	Bureau of Reclamation	Department of Defense	U.S. Forest Service	State	Private	Resource Management Plan	West-Wide Energy Corridor	Percent within Utility Corridor
Applicant's Proposed Action	40.1	20.2	0.0	0.0	0.0	2.9	17.0	0.0	0.0	0.0
Variation S4-A1	*5.9*	*0.7*	*0.0*	*0.0*	*0.0*	*0.0*	*5.2*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.7*	*0.0*	*0.0*	*0.0*	*0.0*	*5.3*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.8*	*0.0*	*0.0*	*0.0*	*0.0*	*5.3*	*0.0*	*0.0*	*0.0*
Tub Mountain South	40.5	25.7	0.0	0.0	0.0	0.0	14.8	1.8	3.2	11.1
Willow Creek	34.6	15.2	0.0	0.0	0.0	0.0	19.4	0.0	0.0	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses predominately BLM-administered lands (20.2 miles) and private lands (17 miles). Other jurisdictions crossed include state lands (2.9 miles).

This alternative is not located within a designated utility corridor. The Applicant's Proposed Action Alternative is sited parallel (within 300 to 2,000 feet from route centerline) to an existing 138-kV transmission line (6 miles) a 69-kV transmission line (1.5 miles), and roadway facilities (12.2 miles).

Variation S4-A1

Variation S4-A1 shares the same alignment as the Applicant's Proposed Action Alternative. This variation is not located within a designated utility corridor and provides the same opportunity for colocation and siting with parallel facilities as the Applicant's Proposed Action Alternative.

Variation S4-A2

Variation S4-A2 provides more opportunity for colocation with existing utility facilities. This variation is colocated (within 300 feet of variation centerline) of an existing 138-kV transmission line for 5.7 miles. This variation also is sited parallel to (300 to 2,000 feet of variation centerline) existing road facilities for approximately 2.8 miles.

Table 3-281. Parallel Facilities in Segment 4—Brogan																		
Alternative Route	Total Length (miles)	Parallel Linear Facilities (within 300 feet of reference centerline) (miles)							Parallel Linear Facilities (from 300 feet to 2,000 feet from reference centerline) (miles)							Total Miles Parallel Linear Facilities (within 300 feet)	Total Miles Parallel Linear Facilities (from 300 to 2,000 feet)	Total Number of Linear Facility Crossings
		69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads	69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads			
Applicant's Proposed Action	40.1	0.1	0.0	0.1	0.0	0.0	0.0	3.8	1.6	0.0	6.0	0.0	0.0	0.0	12.3	4.0	16.0	20
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.3*	*0.4*	*0.0*	*5.8*	*0.0*	*0.0*	*0.0*	*1.9*	*0.4*	*5.5*	*2*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*5.7*	*0.0*	*0.0*	*0.0*	*0.0*	*1.6*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*2.8*	*5.7*	*0.2*	*2*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*4.8*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*0.0*	*1.1*	*0.0*	*0.0*	*0.0*	*2.8*	*4.9*	*1.1*	*2*
Tub Mountain South	40.5	0.1	0.0	5.7	0.0	0.0	1.0	3.3	2.3	0.0	3.2	0.0	0.0	3.1	20.7	9.9	18.3	30
Willow Creek	34.6	0.1	0.0	0.1	0.0	0.0	0.0	6.4	1.2	0.0	6.0	0.0	0.0	0.0	15.4	6.6	19.1	30

Variation S4-A3

Variation S4-A3 provides a connection from the Flagstaff B – Durkee Alternative to provide opportunity to colocation with existing facilities. This variation then continues on to share the same alignment as Variation S4-A2. Variation S4-A3 is colocated (within 300 feet of variation centerline) of an existing 138-kV transmission line for 4.8 miles. This variation also is sited parallel to (300 to 2,000 feet of variation centerline) existing road facilities for approximately 2.8 miles.

Tub Mountain South Alternative

The Tub Mountain South Alternative predominately crosses BLM-administered lands (40.5). Other jurisdictions crossed include state lands (2.9 miles). This alternative shares the same alignment as Variation S4-A2 for 5.9 miles.

The Tub Mountain South Alternative is located within both an RMP corridor (1.8 miles) for SEORMP area and the West-Wide Energy Corridor utility corridor (3.2 miles). This alternative provides more opportunity for colocation than the Applicant's Proposed Action Alternative. The Tub Mountain South Alternative is colocated (within 300 feet of centerline) with an existing 138-kV transmission line (5.7 miles), existing pipeline (0.9 mile) and existing road facilities 3.3 miles). In addition, this alternative is parallel (300 to 2,000 feet from alternative centerline) to an existing pipeline (3.1 miles) and existing road facilities (20.7 miles).

Willow Creek Alternative

The Willow Creek Alternative crosses private land (19.4 miles) and BLM-administered land (15.2 miles) and is not located within a designated utility corridor.

The Willow Creek Alternative provides similar opportunity for colocation as the Applicant's Proposed Action Alternative. The Willow Creek Alternative is sited parallel (within 300 to 2,000 feet from route centerline) to an existing 138-kV transmission line (6 miles) a 69-kV transmission line (1.2 miles), and roadway facilities (15.4 miles).

Conclusions

The reference centerlines for alternative routes in Segment cross primarily federal lands and some private lands. The percentage of federal lands crossed by Segment 4 alternative routes ranges from 43.9 percent (Willow Creek Alternative) to 63.5 percent (Tub Mountain South Alternative). Only the Tub Mountain South Alternative uses designated utility corridors (5.0 miles). The total miles of parallel linear facilities within 2,000 feet of Segment 4 alternatives range from 20.0 miles (Applicant's Proposed Action Alternative) to 28.2 miles (Tub Mountain South Alternative). The Tub Mountain South Alternative crosses the most federal lands, makes use of designated utility corridors, and parallels the most existing linear facilities compared to other Segment 4 alternative routes.

Existing Land Use

Table 3-282 and Table 3-283 present the residual impacts on existing land use types and structures for all alternative routes and route variations in Segment 4. For locations of residual impacts described below, refer to MV-13.

Table 3-282. Existing Land Use Inventory Data and Overall Residual Impacts for Segment 4—Brogan										
Alternative Route	Total Length (Miles)	Resource Inventory for Existing Land Use GAP Types (miles crossed)						Overall Residual Impacts for Existing Land Use GAP Types (miles crossed)		
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland	None	Low	Moderate
Applicant's Proposed Action	40.1	0.1	1.4	0.0	0.0	16.6	22.0	0.0	40.0	0.1
Variation S4-A1	*5.9*	*0.1*	*0.0*	*0.0*	*0.0*	*2.1*	*3.7*	*0.0*	*5.8*	*0.1*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.5*	*3.5*	*0.0*	*6.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*2.3*	*3.8*	*0.0*	*6.1*	*0.0*
Tub Mountain South	40.5	3.0	1.7	0.1	0.0	19.9	15.8	0.0	37.5	3.0
Willow Creek	34.6	2.0	1.2	0.1	0.1	11.4	19.8	0.0	32.5	2.1

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 0.1 mile of moderate impacts on existing land uses where the reference centerline of the route crosses agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These temporary impacts associated with construction could include detouring of roads, removal of fencing, or non-intentional damage to property. In some cases, access to existing commercial or agricultural operations may be periodically hindered in areas where public and employee access is prohibited for safety reasons. Impacts resulting from the operation of the Applicant's Proposed Action Alternative would likely be minimal as agricultural operations could persist adjacent to and within areas of the right-of-way where transmission facilities could span agricultural features. No high impacts associated with Applicant's Proposed Action Alternative would be expected. Refer to Table 3-248 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 4.

Variation S4-A1

The Variation S4-A1 would result in 0.1 mile of moderate impacts on existing land uses where the reference centerline of the route crosses agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 4. No high impacts associated with the Variation S4-A1 would be expected.

Variation S4-A2

No residual moderate or high impacts associated with the Variation S4-A2 would be expected.

Variation S4-A3

No residual moderate or high impacts associated with the Variation S4-A3 would be expected.

Table 3-283. Residual Impacts for Existing Land Use Structures for Segment 4—Brogan

Alternative Route	Total Length (miles)	Residual Impacts for Each Structure Type (miles crossed)																		Overall Residual Impacts on Structures (miles crossed)		
		Building (Non-residence)		Other		Residential		Rest Stop		Mining/ Extraction		Outstructure		Communication Facility		Power Substation		Windmill				
		None	Low	None	Moderate	None	Moderate	None	Moderate	None	Low	None	Low	None	Low	None	Low	None	Low	None	Low	Moderate
Applicant's Proposed Action	40.1	40.1	0.0	40.1	0.0	40.1	0.0	40.1	0.0	40.1	0.0	40.1	0.0	40.1	0.0	40.1	0.0	40.0	0.1	40.0	0.1	0.0
Variation S4-A1	*5.9*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*5.9*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*6.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*6.1*	*0.0*	*0.0*
Tub Mountain South	40.5	40.5	0.0	40.5	0.0	40.5	0.0	40.5	0.0	40.5	0.0	40.5	0.0	40.5	0.0	40.5	0.0	40.5	0.0	40.5	0.0	0.0
Willow Creek	34.6	34.6	0.0	34.6	0.0	34.6	0.0	34.6	0.0	34.6	0.0	34.6	0.0	34.6	0.0	34.6	0.0	34.5	0.1	34.5	0.1	0.0

Tub Mountain South Alternative

The Tub Mountain South Alternative would result in 3.0 miles of moderate impacts on existing land uses where the reference centerline of the route crosses agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 4. No high impacts associated with this alternative would be expected. Refer to Table 3-248 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 4.

Willow Creek Alternative

The Willow Creek Alternative would result in 2.1 miles of moderate impacts on existing land uses where the reference centerline of the route crosses agricultural forest/woodland areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 4. No high impacts associated with this alternative would be expected. Refer to Table 3-248 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 4.

Conclusions

In Segment 4, no high residual impacts on existing land uses would be anticipated. Moderate residual impacts associated with Segment 4 alternative routes would occur where the Project would cross agricultural or forested/woodland areas. The lengths of the alternative routes in this segment range from 34.6 miles (Willow Creek Alternative) to 40.5 miles (Tub Mountain South Alternative). Overall, moderate residual impacts on existing land uses would range from 0.1 mile (Applicant's Proposed Action Alternative) to 3.0 miles (Tub Mountain South Alternative). Considering the overall length of an alternative route and the extent of residual moderate impacts, the Applicant's Proposed Action Alternative would have the least moderate residual impacts on existing land uses among the Segment 4 alternative routes. There is no notable difference in impacts on existing land uses among the variations.

Timber Management

No forested vegetation, and, thus, no timber resources, are crossed by Applicant's Proposed Action Alternative and other alternatives and route in Segment 4.

Conclusions

No identifiable impacts on timber management would occur on any alternative routes and variations analyzed in Segment 4.

Fire Management

Refer to the discussion in the Effects Common to All Alternatives section.

Conclusions

There is no discernable difference in impacts on fire management among the alternative routes and variations analyzed in Segment 4.

Zoning

The result of the effects analysis for zoning for the alternatives and route variations in Segment 4 are described below in terms of miles crossed of EFU or ERU zones. As discussed in Effects Common to All Alternatives for Zoning there are no identified zones crossed that prohibit the development of the B2H Project facilities; however, in areas where the B2H Project crosses EFU or ERU zones, the Applicant would have to demonstrate necessity as described in Section 3.2.6.2 Regulatory Framework. In all cases the potential effect of not demonstrating necessity could result in non-conformance with Oregon Statewide Planning Goals. Refer to MV-14 for locations of EFU and ERU zoning.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses approximately 12.7 miles of EFU zoning and 27.3 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S4-A1

The Variation S4-A1 crosses approximately 5.9 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S4-A2

The Variation S4-A2 crosses approximately 6.0 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S4-A3

The Variation S4-A3 crosses approximately 6.1 miles of EFU zoning. Potential effects are discussed in Effects Common to All Alternatives.

Tub Mountain South Alternative

The Tub Mountain South Alternative crosses approximately 14.1 miles of EFU zoning and 26.4 of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Willow Creek Alternative

The Willow Creek Alternative crosses approximately 12.0 miles of EFU zoning and 22.5 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Conclusions

Because the Applicant has elected to demonstrate compliance with statewide planning goals by under Path B, the EFSC would determine whether the project complies with applicable Land Conservation and Development Commission rules and land-use statutes (including statewide planning goals), and any applicable, substantive criteria from each county's local comprehensive plan and land-use regulations. There is no notable difference among Segment 4 alternative routes or variations with regard to zoning. All cross similar distances of EFU zones.

Military Training

Table 3-280 describes the MTRs crossed for the alternatives and route variations in Segment 4.

Applicant's Proposed Action Alternative

The types of impacts on military training in special-use airspace would be the similar as those described for the Applicant's Proposed Action Alternative for Segment 2.

The Applicant's Proposed Action Alternative route variations would not cross MTRs; therefore, no effects are anticipated to occur.

Tub Mountain South Alternative

The Tub Mountain South Alternative does not cross any MTRs; therefore, no effects are anticipated to occur.

Willow Creek Alternative

The Willow Creek Alternative does not cross any MTRs; therefore, no effects are anticipated to occur.

Conclusions

There is no discernable difference in impacts on military training among the alternative routes analyzed in Segment 4.

Specially Designated Areas

There are no specially designated areas crossed by any alternative or route variation in Segment 4. Although the Oregon National Historic Trail ACEC – Birch Creek and Tub Mountain parcels are within the 1-mile-wide study corridors in this segment, they are not located within the 250 foot right-of-way. No activities associated with the project would occur within the ACEC; thus, it is not anticipated that specially designated areas would be affected by the B2H Project.

Conclusions

There is no discernable difference in impacts on specially designated areas among the alternative routes analyzed in Segment 4.

SEGMENT 5—MALHEUR

Land Ownership, Utility Corridors, and Parallel Facilities

Table 3-284 and Table 3-285 present the miles of land ownership, utility corridors, and parallel facilities crossed for the alternatives and route variations in Segment 5.

Table 3-284. Land Ownership and Utility Corridors Inventory Data and Residual Impacts for Segment 5—Malheur (miles crossed)										
Alternative Route	Total Length (miles)	Land Ownership						Utility Corridors		
		Bureau of Land Management	Bureau of Reclamation	Department of Defense	U.S. Forest Service	State	Private	Resource Management Plan	West-Wide Energy Corridor	Percent within Utility Corridor
Applicant's Proposed Action	40.4	30.4	0.8	0.0	0.0	0.0	9.2	12	0.8	30.2
Variation S5-A1	*7.4*	*1.1*	*0.0*	*0.0*	*0.0*	*0.0*	*6.3*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*2.1*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*0.0*	*52.0*
Variation S5-B2	*2.8*	*1.3*	*0.2*	*0.0*	*0.0*	*0.0*	*1.3*	*1.3*	*0.0*	*46.4*
Malheur S	43.5	39.2	0.5	0.0	0.0	0.0	3.8	7.0	3.4	20.0
Malheur A	43.1	37.9	0.8	0.0	0.0	0.0	4.4	3.5	3.5	14.2

Applicant's Proposed Action Alternative

The Applicant's Proposed Action crosses predominately BLM-administered lands (30.4 miles) and private lands (9.2 miles). Other jurisdictions crossed include Reclamation lands (0.8 mile).

This alternative is located within both an RMP corridor (12 miles) for the SEORMP area and the West-Wide Energy Corridor utility corridor (0.8 mile). Small portions (less than one mile) of the Applicant's Proposed Action Alternative are colocated with or parallel to existing transmission lines. Approximately 8.6 miles is colocated with existing roadway facilities. This alternative also is sited parallel (within 300 to 2,000 feet from route centerline) to existing roadway facilities (16.3 miles). The 2016 368 Corridor Study is ongoing. However, some segments of existing West-Wide Energy Corridors are identified as corridors of concern within the Owyhee Field Office due to location of the corridor through sensitive resources. This concern does not apply to the entire corridor; therefore, additional agency coordination may be required for the use of existing West-Wide Energy Corridors during final design of the B2H Project.

Variation S5-A1

Variation S5-A1 shares the same alignment as the Applicant's Proposed Action Alternative for 7.4 miles. This variation was developed to avoid crossing lands with wilderness characteristics. Variation S5-A1 crosses predominately private land (6.3 miles) and a small portion (1.1 miles) of BLM-administered lands and is not located within a designated utility corridor.

Variation S5-A1 is sited parallel (within 300 to 2,000 feet of variation centerline) to existing roadway facilities for 2.9 miles.

Table 3-285. Parallel Facilities in Segment 5—Malheur

Alternative Route	Total Length (miles)	Parallel Linear Facilities (within 300 feet of reference centerline) (miles)							Parallel Linear Facilities (from 300 feet to 2,000 feet from reference centerline) (miles)							Total Miles Parallel Linear Facilities (within 300 feet)	Total Miles Parallel Linear Facilities (from 300 to 2,000 feet)	Total Number of Linear Facility Crossings
		69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads	69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads			
Applicant's Proposed Action	40.4	0.1	0.1	0.0	0.0	0.1	0.0	8.6	0.7	0.7	0.0	0.0	0.8	0.0	16.3	8.7	16.2	54
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.9*	*0.8*	*2.9*	*7*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.6*	*0.5*	*2.6*	*5*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.6*	*0.9*	*1.6*	*10*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.2*	*0.6*	*2.2*	*5*
Malheur S	43.5	0.1	0.1	0.0	0.0	0.2	0.0	7.1	0.7	0.7	0.0	0.0	7.1	0.0	16.2	7.3	18.3	27
Malheur A	43.1	0.1	0.1	0.0	0.0	0.1	0.0	4.7	0.7	0.7	0.0	0.0	7.7	0.0	17.4	4.8	20.6	39

Variation S5-A2

Variation S5-A2 is located solely on BLM-administered lands. This variation is not located within a designated utility corridor and crosses an area with wilderness characteristics.

Variation S5-A2 is sited parallel (within 300 to 2,000 feet of variation centerline) to existing roadway facilities for 2.6 miles.

Variation S5-B1

Variation S5-B1 shares the same alignment as the Applicant's Proposed Action Alternative for 2.6 miles. This variation crosses predominately BLM-administered lands (2.6 miles) as well as Reclamation lands (0.4 mile).

Variation S5-B1 is located within a small portion of the RMP corridor for the SEORMP area, and crosses the Owyhee River in an area that is determined to be suitable for wild and scenic designation. This variation is sited parallel (300 to 2,000 feet from variation centerline) to existing roadway facilities for 1.6 miles.

Variation S5-B2

Variation S5-B2 was developed to cross lands outside the area suitable for wild and scenic designation. This variation crosses BLM-administered lands (1.3 miles) and private lands (1.3 miles). Other jurisdictions crossed include Reclamation (0.2 mile).

This variation is located within an RMP utility corridor for the SEORMP area and is sited parallel (300 to 2,000 feet from variation centerline) to existing roadway facilities for 2.2 miles.

Malheur S Alternative

The Malheur S Alternative crosses predominately BLM-administered lands. Other jurisdictions crossed include private (3.8 miles) and Reclamation (0.5 mile). This alternative is located in an RMP utility corridor (7 miles) for the SEORMP area and within the West-Wide Energy Corridor utility corridor (3.4 miles).

Malheur S Alternative is sited parallel (within 300 to 2,000 feet of variation centerline) to existing roadway facilities for 16.3 miles.

Malheur A Alternative

The Malheur A Alternative crosses predominately BLM-administered lands (37.9 miles). Other jurisdictions crossed include private (4.3 mile) and Reclamation (0.8 mile). This alternative is located within both an RMP utility corridor (3.5 miles) for the SEORMP area and the West-Wide Energy Corridor utility corridor (3.5 miles).

The Malheur A Alternative is sited parallel (within 300 to 2,000 feet of variation centerline) to existing roadway facilities for 17.4 miles.

Conclusions

The reference centerlines for alternative routes in Segment 5 cross primarily federal lands and some private lands. The percentage of federal lands crossed by Segment 5 alternative routes ranges from 77.2 percent (Applicant's Proposed Action Alternative) to 91.2 percent (Malheur S Alternative). Additionally, Segment 5 alternatives use from 7.0 miles (Malheur A Alternative) and 12.8 miles (Applicant's Proposed Action Alternative) of designated utility corridors. The total miles of parallel linear facilities within 2,000 feet of Segment 5 alternatives range from 24.9 miles (Applicant's Proposed Action Alternative) to 25.6 miles (Malheur S Alternative). The Malheur S Alternative would use more federal lands, and would parallel more existing linear facilities as compared to other Segment 5 alternatives. The Malheur S Alternative uses less miles of designated utility corridors (2.4 miles less) than the Applicant's Proposed Action Alternative.

Existing Land Use

Table 3-286 and Table 3-287 present the residual impacts on existing land use types and structures for all alternative routes and route variations in Segment 5. For locations of residual impacts described below refer to MV-13.

Table 3-286. Existing Land Use Inventory Data and Overall Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Resource Inventory for Existing Land Use GAP Types (miles crossed)						Overall Residual Impacts for Existing Land Use GAP Types (miles crossed)		
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland	None	Low	Moderate
Applicant's Proposed Action	40.4	0.2	7.2	0.2	0.1	11.7	21.0	0.0	40.1	0.3
Variation S5-A1	*7.4*	*0.0*	*0.6*	*0.0*	*0.0*	*5.2*	*1.6*	*0.0*	*7.4*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.9*	*0.0*	*0.0*	*4.0*	*2.5*	*0.0*	*7.4*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.2*	*0.1*	*0.1*	*0.2*	*1.9*	*0.0*	*2.4*	*0.1*
Variation S5-B2	*2.8*	*0.9*	*0.1*	*0.0*	*0.0*	*0.0*	*1.8*	*0.0*	*1.9*	*0.9*
Malheur S	43.5	0.1	7.5	0.1	0.0	10.5	25.3	0.0	43.4	0.1
Malheur A	43.1	0.1	6.9	0.1	0.0	9.6	26.4	0.0	43.0	0.1

Table 3-287. Residual Impacts for Existing Land Use Structures for Segment 5—Malheur

Alternative Route	Total Length (miles)	Residual Impacts for Each Structure Type (miles crossed)																		Overall Residual Impacts on Structures (miles crossed)		
		Building (Non-residence)		Other		Residential		Rest Stop		Mining/ Extraction		Outstructure		Communication Facility		Power Substation		Windmill				
		None	Low	None	Moderate	None	Moderate	None	Moderate	None	Low	None	Low	None	Low	None	Low	None	Low	None	Low	Moderate
Applicant's Proposed Action	40.4	40.4	0.0	40.4	0.0	40.4	0.0	40.4	0.0	40.3	0.1	40.2	0.2	40.4	0.0	40.4	0.0	40.4	0.0	40.1	0.3	0.0
Variation S5-A1	*7.4*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*2.5*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*0.0*
Malheur S	43.5	43.5	0.0	43.5	0.0	43.5	0.0	43.5	0.0	43.5	0.0	43.5	0.0	43.5	0.0	43.5	0.0	43.5	0.0	43.5	0.0	0.0
Malheur A	43.1	43.1	0.0	43.1	0.0	43.1	0.0	43.1	0.0	43.1	0.0	43.0	0.1	43.1	0.0	43.1	0.0	43.1	0.0	43.0	0.1	0.0

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 0.3 mile of moderate impacts on existing land uses where the reference centerline of the route crosses forest/woodland and agricultural areas that result in short-term conflicts with agricultural production or natural resource development. These temporary impacts associated with construction could include detouring of roads, removal of fencing, or non-intentional damage to property. In some cases, access to existing commercial or agricultural operations may be periodically hindered in areas where public and employee access is prohibited for safety reasons. Impacts resulting from the operation of the Applicant's Proposed Action Alternative would likely be minimal as agricultural operations could persist adjacent to and within areas of the right-of-way where transmission facilities could span agricultural features. No high impacts associated with Applicant's Proposed Action Alternative would be expected. Refer to Table 3-255 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 5.

Variations S5-A1 and S5-A2

No moderate or high impacts associated with Variations S5-A1 and S5-A2 would be expected.

Variations S5-B1 and S5-A2

Variations S5-B1 and S5-B2 would result in 0.1 mile of moderate impacts on existing land uses where the reference centerline crosses forest/woodland areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high residual impacts associated with these variations would be expected.

Malheur S Alternative

The Malheur S Alternative would result in 0.1 mile of moderate impacts on existing land uses where the reference centerline of the route crosses agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 5. No high impacts associated with this alternative would be expected. Refer to Table 3-255 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 5.

Malheur A Alternative

The Malheur A Alternative would result in 0.1 mile of moderate impacts on existing land uses where the reference centerline of the route crosses agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These impacts would be similar to those described for the Applicant's Proposed Action Alternative for Segment 5. No high impacts associated with this alternative would be expected. Refer to Table 3-255 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 5.

Conclusions

In Segment 5, no high residual impacts are anticipated on existing land uses from any of the alternatives. Moderate residual impacts associated with Segment 5 alternative routes would occur where the Project would cross agricultural or forested/woodland areas. The lengths of the alternative routes in this segment range from 40.4 miles (Applicant's Proposed Action Alternative) to 43.5 miles

(Malheur S Alternative). Overall, moderate residual impacts on existing land uses would range from approximately 0.1 mile (Malheur S and Malheur A alternatives) to 0.3 mile (Applicant's Proposed Action Alternative). The Applicant's Proposed Action Alternative would have the least effects on existing land uses among the alternative routes in Segment 5. There is no notable in impacts on existing land uses among the variations.

Timber Management

No forested vegetation, and, thus, no timber resources, is crossed by the alternatives and route variations in Segment 5.

Conclusions

No identifiable impacts on timber management would occur on any alternative route or variation analyzed in Segment 5.

Fire Management

Refer to the discussion in the Effects Common to All Alternatives section.

Conclusions

There is no discernable difference in impacts on fire management among the alternative routes and variations analyzed in Segment 5.

Zoning

The result of the effects analysis for zoning for the alternatives and route variations in Segment 5 are described below in terms of miles crossed of EFU or ERU zones. As discussed in Effects Common to All Alternatives for Zoning there are no identified zones crossed that prohibit the development of the B2H Project facilities; however, in areas where the B2H Project crosses EFU or ERU zones, the Applicant would have to demonstrate necessity as described in Section 3.2.6.2 Regulatory Framework. In all cases the potential effect of not demonstrating necessity could result in non-conformance with Oregon Statewide Planning Goals. Refer to MV-13 for locations of EFU and ERU zoning.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses 1.9 miles of EFU zoning and 38.4 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S5-A1

The Variation S5-A1 crosses 1.4 miles of EFU zoning and 6.0 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S5-A2

The Variation S5-A2 does not cross any EFU zoning and 2.5 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S5-B1

The Variation S5-B1 does not cross any EFU zoning and 6.0 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S5-B2

The Variation S5-B2 crosses 1.4 miles of EFU zoning and 1.4 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Malheur S Alternative

The Malheur S Alternative crosses 0.5 mile of EFU zoning and 42.9 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Malheur A Alternative

The Malheur A Alternative crosses 0.5 mile of EFU zoning and 42.5 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Conclusions

Because the Applicant has elected to demonstrate compliance with statewide planning goals by under Path B, the EFSC would determine whether the project complies with applicable Land Conservation and Development Commission rules and land-use statutes (including statewide planning goals), and any applicable, substantive criteria from each county's local comprehensive plan and land-use regulations. There is no notable difference among Segment 5 alternative routes or variations with regard to zoning. All cross similar distances of EFU zones.

Military Training

Table 3-284 describes the MTRs crossed for the alternatives and route variations in Segment 5.

Applicant's Proposed Action Alternative

The types of impacts on military training in special-use airspace would be similar to those described for the Applicant's Proposed Action for Segment 2.

Malheur S Alternative

Effects on military training in special-use airspace from the Malheur S Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Malheur A Alternative

Effects on military training in special-use airspace from the Malheur A Alternative would be the same as those described for the Applicant's Proposed Action Alternative.

Conclusions

There is no discernable difference in impacts on military training among the alternative routes analyzed in Segment 5.

Specially Designated Areas

Table 3-288 presents the specially designated areas crossed by the alternatives and route variations in Segment 5.

Table 3-288. Specially Designated Areas in Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Area of Critical Environmental Concern	Wildlife Area	Research Natural Area
Applicant's Proposed Action	40.4	0.0	0.0	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*
Malheur S	43.5	1.5	0.0	0.0
Malheur A	43.1	2.5	0.0	0.0

Applicant's Proposed Action Alternative and Variations

This alternative route and variations do not cross any specially designated areas, thus no identifiable impacts would occur.

Malheur S Alternative

The Malheur S Alternative crosses 1.5 miles of the Owyhee River Below the Dam ACEC (Link 5-30). This ACEC is identified as an avoidance area for new rights-of-way in the SEORMP. Thus, granting rights-of-way within this area should be avoided to the extent possible. However, new rights-of-way may be granted if there is minimal conflict with identified resource values and impacts can be mitigated.

This ACEC is being managed for the high scenic values of diverse landscape elements in a substantially natural setting; the presence of a special status plant species (Mulford's milkvetch), the rare presence of a black cottonwood gallery in a riverine system; and the combined wildlife values of diverse habitat types supporting a large number of wildlife species and important migratory corridor for neotropical birds. As discussed in the Mitigation Planning and Effectiveness section, application of Mitigation Measures 1, 2, 5, 6, 8, 12, 13, 14, and 15 on the resources present in this area would minimize the potential effects of the B2H Project and management of the area for the established objectives would not be precluded. Temporary disturbance to the special status plant species and wildlife for which this ACEC is managed is anticipated during construction. Refer to Sections 3.2.3, 3.2.4, 3.2.8, and 3.2.12 for further description of potential effects on vegetation, wildlife, recreation, and visual resources in this ACEC.

Malheur A Alternative

The Malheur A Alternative crosses 2.5 miles of the Owyhee River Below the Dam ACEC (Link 5-35). Effects on the ACEC will be similar to those discussed under the Malheur S Alternative; however this alternative crosses the ACEC for 1.0 mile longer within the West-Wide Energy Corridor.

Conclusions

The Applicant's Proposed Action Alternative and variations do not cross any specially designated areas in Segment 5. Both the Malheur S and Malheur A Alternatives cross the Owyhee River Below the Dam ACEC. Malheur A Alternative also crosses this ACEC but is located in a designated utility corridor (WWEC).

SEGMENT 6—TREASURE VALLEY

Land Ownership, Utility Corridors, and Parallel Facilities

Table 3-289 and Table 3-290 present the miles of land ownership, utility corridors, and parallel facilities crossed for the alternatives and route variations in Segment 6.

Table 3-289. Land Ownership and Utility Corridors Inventory Data and Residual Impacts for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Land Ownership						Utility Corridors		
		Bureau of Land Management	Bureau of Reclamation	Department of Defense	U.S. Forest Service	State	Private	Resource Management Plan	West-Wide Energy Corridor	Percent within Utility Corridor
Applicant's Proposed Action	28.0	21.4	0.0	0.0	0.0	2.4	4.2	11.4	11.4	40.7
Variation S6-A1	*9.3*	*8.1*	*0.0*	*0.0*	*0.0*	*0.0*	*1.2*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*5.8*	*0.0*	*0.0*	*0.0*	*0.7*	*2.4*	*2.7*	*2.4*	*30.3*
Variation S6-B1	*14.4*	*10.7*	*0.0*	*0.0*	*0.0*	*2.4*	*1.3*	*10.7*	*10.7*	*74.3*
Variation S6-B2	*14.1*	*10.3*	*0.0*	*0.0*	*0.0*	*2.8*	*1.0*	*10.3*	*10.3*	*73.0*

Applicant's Proposed Action Alternative

This alternative crosses predominately BLM-administered lands (21.4 miles). Other jurisdictions crossed include private lands (4.2 miles) and state lands (2.4 miles). This alternative is located within an RMP corridor (11.4 miles) for the SEORMP area as well as the West-Wide Energy Corridor utility corridor (11.4 miles). The 2016 368 Corridor Study is ongoing. However, some segments of existing West-Wide Corridors are identified as corridors of concern within the Owyhee Field Office due to location of the corridor through sensitive resources. This concern does not apply to the entire corridor, therefore, additional agency coordination may be required for the use of existing West-Wide Energy Corridors during final design of the B2H Project.

The Applicant's Proposed Action Alternative is colocated (within 300 feet of route centerline) of existing roadway faculties for 6.7 miles. In addition, this alternative is sited parallel (300 to 2,000 feet from route centerline) to existing 500-kV (7.5 miles), a 230-kV (1.2 miles) and 69-kV (0.8 mile) transmission lines as well as existing road facilities (17.3 miles).

Table 3-290. Parallel Facilities in Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Parallel Linear Facilities (within 300 feet of reference centerline) (miles)							Parallel Linear Facilities (from 300 feet to 2,000 feet from reference centerline) (miles)							Total Miles Parallel Linear Facilities (within 300 feet)	Total Miles Parallel Linear Facilities (from 300 to 2,000 feet)	Total Number of Linear Facility Crossings
		69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads	69-kV	115-kV	138-kV	230-kV	500-kV	Pipeline	Roads			
Applicant's Proposed Action	28.0	0.2	0.0	0.0	0.0	0.2	0.0	6.7	0.8	0.0	0.0	1.2	7.5	0.0	17.3	6.9	17.7	43
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*5.1*	*1.6*	*5.1*	*11*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*0.0*	*0.0*	*0.0*	*0.0*	*4.8*	*0.0*	*6.2*	*1.3*	*7.1*	*10*
Variation S6-B1	*14.4*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.0*	*0.8*	*0.0*	*0.0*	*0.0*	*4.5*	*0.0*	*9.7*	*4.0*	*9.7*	*25*
Variation S6-B2	*14.1*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.1*	*0.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*7.8*	*4.1*	*7.8*	*24*

Variation S6-A1

Variation S6-A1 shares the same alignment as the Applicant's Proposed Action Alternative for 9.3 miles. This variation is not located within a designated utility corridor and provides the same opportunity for colocation and siting with parallel facilities as the Applicant's Proposed Action Alternative.

Variation S6-A2

This variation is located within an RMP utility corridor (2.7 miles) for the Owyhee Field Office and within the West-Wide Energy Corridor utility corridor (2.4 miles). Variation S6-A2 provides more opportunity for siting with parallel facilities than Variation S6-A1. This variation is sited parallel (300 to 2,000 feet from variation centerline) to an existing 500-kV transmission line (4.8 miles) and existing roadway facilities (6.16 miles).

Variation S6-B1

Variation S6-B1 shares the same alignment as the Applicant's Proposed Action Alternative for 14.4 miles. This variation is located within an RMP utility corridor (10.7 miles) for the Owyhee Field Office and within the West-Wide Energy Corridor utility corridor (10.7 miles).

Variation S6-B1 provides more opportunity for siting with parallel facilities than S6-B2. This variation is sited parallel (300 to 2,000 feet from variation centerline) to an existing 500-kV transmission line (4.5 miles) and existing roadway facilities (9.7 miles).

Variation S6-B2

Variation S6-B2 crosses predominately BLM-administered lands (10.3 miles) and state lands (2.8 miles). Other jurisdictions crossed include private lands (1.0 mile). This variation is located within an RMP utility corridor (10.3 miles) for the Owyhee Field Office and within the West-Wide Energy Corridor utility corridor (10.3 miles).

Variation S6-B2 provides less opportunity for colocation or siting parallel to existing facilities since it is not sited parallel to the existing 500-kV transmission line.

Conclusions

There is no notable difference in land ownership or parallel linear facilities among the variations analyzed in Segment 6. Variation S6-A2 makes the most use of designated utility corridor.

Existing Land Use

Table 3-291 and Table 3-292 present the residual impacts on existing land use types and structures for all alternative routes and route variations in Segment 6. For locations of residual impacts described below refer to MV-13.

Table 3-291. Existing Land Use Inventory Data and Overall Residual Impacts for Segment 6—Treasure Valley										
Alternative Route	Total Length (Miles)	Resource Inventory for Existing Land Use GAP Types (miles crossed)						Overall Residual Impacts for Existing Land Use GAP Types (miles crossed)		
		Agriculture	Bare Ground, Cliff, Talus	Developed/ Disturbed	Forest/ Woodland	Grassland	Shrubland	None	Low	Moderate
Applicant's Proposed Action	28.0	0.5	0.7	0.1	0.2	12.9	13.6	0.0	27.2	0.8
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*4.8*	*4.5*	*0.0*	*9.3*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.2*	*0.0*	*0.0*	*4.1*	*4.6*	*0.0*	*8.9*	*0.0*
Variation S6-B1	*14.4*	*0.1*	*0.7*	*0.1*	*0.1*	*5.8*	*7.6*	*0.0*	*14.1*	*0.3*
Variation S6-B2	*14.1*	*0.1*	*1.4*	*0.2*	*0.2*	*3.7*	*8.5*	*0.0*	*13.8*	*0.3*

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 0.8 mile of moderate impacts on existing land uses where the reference centerline of the route crosses forest/woodland and agricultural areas that could result in short-term conflicts with agricultural production or natural resource development. These temporary impacts associated with construction could include detouring of roads, removal of fencing, or non-intentional damage to property. In some cases, access to existing commercial or agricultural operations may be periodically hindered in areas where public and employee access is prohibited for safety reasons. Impacts resulting from the operation of the Applicant's Proposed Action Alternative would likely be minimal as agricultural operations could persist adjacent to and within areas of the right-of-way where transmission facilities could span agricultural features. No high impacts associated with Applicant's Proposed Action Alternative would be expected. Refer to Table 3-262 for information regarding structures crossed or adjacent to alternative routes and route variations in Segment 6.

Variations S6-A1 and S6-A2

No residual moderate or high impacts associated with the Variations S6-A1 and S6-A2 would be expected.

Variations S6-B1 and S6-B2

Variations S6-B1 and S6-B3 would result in 0.3 mile of moderate impacts on existing land uses where the reference centerline of the route crosses forest/woodland and agricultural areas resulting in similar impacts as described for the Applicant's Proposed Action Alternative. No high impacts associated with these variations would be expected.

Table 3-292. Residual Impacts for Existing Land Use Structures for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Residual Impacts for Each Structure Type (miles crossed)																		Overall Residual Impacts on Structures		
		Building (Non-residence)		Other		Residential		Rest Stop		Mining/ Extraction		Outstructure		Communication Facility		Power Substation		Windmill				
		None	Low	None	Moderate	None	Moderate	None	Moderate	None	Low	None	Low	None	Low	None	Low	None	Low	None	Low	Moderate
Applicant's Proposed Action	28.0	28.0	0.0	27.9	0.1	28.0	0.0	28.0	0.0	28.0	0.0	28.0	0.0	28.0	0.0	27.9	0.1	28.0	0.0	27.8	0.1	0.1
Variation S6-A1	*9.3*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*8.8*	*0.1*	*8.9*	*0.0*	*8.9*	*0.0*	*8.9*	*0.0*	*8.9*	*0.0*	*8.8*	*0.1*	*8.9*	*0.0*	*8.9*	*0.0*	*8.9*	*0.0*	*8.8*	*0.1*	*0.0*
Variation S6-B1	*14.4*	*14.4*	*0.0*	*14.3*	*0.1*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*14.3*	*0.0*	*0.1*
Variation S6-B2	*14.1*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*14.1*	*0.0*	*0.0*

Conclusions

In Segment 6, no high residual impacts are anticipated on existing land uses. Moderate residual impacts associated with the Applicant's Proposed Action Alternative and variations would occur where the reference centerline crosses agricultural or forested/woodland areas, and existing structures. There is no notable difference among variations with regard to impacts on existing land uses in Segment 6.

Timber Management

Applicant's Proposed Action Alternative

No forested vegetation is crossed by the Applicant's Proposed Action in Segment 6, thus no identifiable impacts on timber management would occur.

Variations S6-A1, S6-A2, and S6-B1

No forested vegetation is crossed by these variations, thus no identifiable impacts on timber management would occur.

Variation S6-B2

Variation S6-B2 crosses 0.1 mile of forested vegetation. Trees would be removed where present in this location as needed for required conductor clearance in the right-of-way. Because the trees present in this location are not part of a forested landscape, effects on timber management are not anticipated. Any private or personal use of timber in this location may be affected by the removal of trees within the B2H Project right-of-way.

Conclusions

Variation S6-B2 crosses forested vegetation. However, no identifiable impacts on timber management are anticipated in this location. Thus, there is no discernable difference in impacts on timber management among the Applicant's Proposed Action Alternative and route variations analyzed in Segment 6.

Fire Management

Refer to the discussion in the Effects Common to All Alternatives section.

Conclusions

There is no discernable difference in impacts on fire management among the Applicant's Proposed Action Alternative and route variations analyzed in Segment 6.

Zoning

The result of the effects analysis for zoning for the alternatives and route variations in Segment 6 are described below in terms of miles crossed of EFU or ERU zones. As discussed in Effects Common to All Alternatives for Zoning there are no identified zones crossed that prohibit the development of the B2H Project facilities; however, in areas of Oregon where the B2H Project crosses EFU or ERU zones, the Applicant would have to demonstrate necessity as described in Section 3.2.6.2 Regulatory Framework. In all cases the potential effect of not demonstrating necessity could result in non-

conformance with Oregon Statewide Planning Goals. Refer to MV-13 for locations of EFU and ERU zoning.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative does not cross any EFU zoning but does cross 4.1 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S6-A1

The Variation S6-A1 does not cross any EFU zoning but does cross 2.6 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S6-A2

The Variation S6-A2 crosses 0.3 mile of EFU zoning and 1.8 miles of ERU Zoning. Potential effects are discussed in Effects Common to All Alternatives.

Variation S6-B1

The Variation S6-B1 does not cross any EFU or ERU zoning, thus no identifiable impacts would occur on property zoned EFU or ERU.

Variation S6-B2

The Variation S6-B2 does not cross any EFU or ERU zoning, thus no identifiable impacts would occur on property zoned EFU or ERU.

Conclusions

Because the Applicant has elected to demonstrate compliance with statewide planning goals by under Path B, the EFSC would determine whether the B2H Project complies with applicable Land Conservation and Development Commission rules and land-use statutes (including statewide planning goals), and any applicable, substantive criteria from each county's local comprehensive plan and land-use regulations. There is no notable difference among the Applicant's Proposed Action and variations with regard to zoning.

Military Training

Table 3-289 describes the MTRs crossed for the alternatives and route variations in Segment 6.

Applicant's Proposed Action Alternative

The types of impacts on military training in special-use airspace would be similar to those described for the Applicant's Proposed Action Alternative for Segment 2. However, only 1 miles of special-use airspace is crossed within Segment 6.

The Applicant's Proposed Action Alternative route variations would not cross MTRs; therefore, no effects are anticipated to occur.

Conclusions

There is no discernable difference in impacts on military training among the Applicant's Proposed Action Alternative and variations analyzed in Segment 6.

Specially Designated Areas

Applicant's Proposed Action Alternative

Construction of the Applicant's Proposed Action Alternative would temporarily disturb approximately 193 acres in the BLM Hard Trigger herd management area, which includes 66,063 total acres of public and other land within the BLM Owyhee Field Office. The horses share the herd management area with other wildlife, including deer, antelope, and upland game birds. Because construction would affect less than 1 percent of the land within the Hard Trigger Herd Management Unit and would be located near the northeastern boundary of the herd management area, direct and indirect construction and operations effects on wild horse herd management operations are anticipated to be low.

Variation S6-A1 and S6-A2

Variations S6-A1 and S6-A2 would not cross the Jump Creek ACEC or the Hard Trigger herd management area. Therefore, no identifiable impacts are anticipated to these resources.

Variation S6-B1

Impacts would be the same as those discussed for the Applicant's Proposed Action Alternative.

Variation S6-B2

The Jump Creek ACEC is not within the 250-foot right-of-way for Variation S6-B2; therefore, no identifiable impacts are anticipated to this resource. Impacts on the Hard Trigger herd management area would be the same as those discussed for the Applicant's Proposed Action Alternative.

Conclusions

There would be no identifiable impacts on the Jump Creek ACEC from the Applicant's Proposed Action Alternative or route variations analyzed in Segment 6. The Applicant's Proposed Action Alternative, Variation S6-B1, and Variation S6-B2 would have short-term, localized effects on the Hard Trigger herd management area. Variations S6-A1 and S6-A2 avoid the Hard Trigger herd management area.

3.2.7 AGRICULTURE

3.2.7.1 INTRODUCTION

This section describes agricultural resources in eastern Oregon and western Idaho that would be affected by the proposed B2H Project. This includes the regulatory framework, issues identified for analysis, methodology, affected environment, and environmental consequences.

3.2.7.2 REGULATORY FRAMEWORK

FEDERAL

Farmland Protection Policy Act

Prime and Unique Farmland

Federal legislative acts addressing the management and protection of prime or unique farmland include the Farmland Protection Policy Act of 1984; Executive Order 11752 (1973); Executive Order 11988 (1973); Secretary of Agriculture Memorandum 1827; and Departmental Regulation 9500-003 (USDA 1983) for prime farmland. The Farmland Protection Policy Act is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible, federal programs are administered to be compatible with state, local governments, and private programs and policies to protect farmland. For the purpose of the Farmland Protection Policy Act, farmland is termed “Important Farmland” and includes prime farmland, unique farmland, and farmland of statewide or local importance (NRCS 2012, 2013).

Projects are subject to the Farmland Protection Policy Act if they may irreversibly convert farmland to nonagricultural use and are completed by a federal agency or with assistance from a federal agency. Projects subject to the act are required to complete a Farmland Conversion Impact Rating form in conjunction with the NRCS to report potential conversion of important farmland. As per conversation with the NRCS point-of-contact for the Farmland Protection Policy Act for Oregon, the B2H Project does not need to complete the Farmland Conversion Impact Rating form because the B2H Project is not federally funded (Ron Raney, Farmland Protection Policy Act Oregon State Point-of-Contact, personal communication with Tamara Gertsch, Scott Whitesides, Renee Straub, and Cindy Smith, February 22, 2016). However, acreages of important farmland potentially affected are included in the Final EIS for comparison by alternative and route variation.

As defined in the Farmland Protection Policy Act (7 U.S.C. 4201), prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor and without intolerable soil erosion as determined by the U.S. Secretary of Agriculture. Prime farmland also includes land with the above characteristics but that is being used to produce livestock and timber. It does not include land already in, or committed to, urban development or water storage. Farmland of statewide importance is land in addition to prime farmland that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops as determined by the appropriate state

agencies. These lands are almost prime farmlands and produce high yields of crops when managed with customary farming methods as indicated by the NRCS.

Clean Water Act

The Clean Water Act is a federal statute enacted in 1972 and enforced by the EPA. It established the structure for regulating discharges of pollutants into water, and made it unlawful to do so, unless a permit was obtained. The EPA's NPDES permit program uses these permits to control discharges of pollutants from point sources. A confined animal feeding operation (CAFO), including those that could be affected as part of the B2H Project, is considered a point source and is required to obtain this permit to protect surface and groundwater. To obtain a permit, all CAFOs must develop and implement a comprehensive nutrient management plan, which identifies how manure will be managed and other operational practices so as to minimize impacts on water quality and public health from pathogens and nutrients. Because of the value of the nutrients and organic matter in manure, land application is the most common method of using and disposing of manure (EPA 2015; National Association of State Departments of Agriculture Research Foundation 1999; USDA and EPA 1999).

The comprehensive nutrient management plan identifies the amount, form, source, timing, and placement of manure nutrients depending on the area of land to be fertilized, crop type, soil type, yield goals, manure excretion rates, manure form and source, management capabilities, and nutrient content of the manure. Calculations are performed to determine appropriate application rates that will minimize impacts on surface and groundwater (EPA 2010).

Conservation Reserve Program

The Conservation Reserve Program (CRP) was established by the USDA to improve water quality, prevent soil erosion, and reduce loss of wildlife habitat. It is the largest private-lands conservation program in the U.S. The voluntary program is administered by the Farm Service Agency and provides compensation to offset the costs from temporarily removing land from agricultural production. The owner or operator submits a bid to the program based on acreage of land to be converted to the conservation use. Not all land is eligible for the program. The program is competitive with a maximum number of 27.5 million acres permitted to be enrolled at any given time. CRP acres are managed under minimum 10-year contracts that can be renewed. The CRP is reauthorized periodically. The last reauthorization was the Agricultural Act of 2014 (Farm Service Agency 2015a; USDA 2014a; 2014b)

The Conservation Reserve Enhancement Program (CREP) is a sub program of CRP that targets specific environmental objectives and geographic regions. The program typically provides additional financial incentives beyond the CRP payments. For purposes of this analysis, CRP and CREP are not differentiated, as impacts would be similar to each.

Authorized activities consistent with soil conservation, water quality, and wildlife habitat may be permitted on CRP lands such as wind turbine installation or prescribed grazing. These activities would result in a minimum 25 percent reduction in the annual payment established for the CRP contract. If a landowner wishes to terminate a CRP contract, he/she would face a penalty of full repayment, with

interest, of all funds already received, plus a fee of 25 percent of rental payments received. However, the Secretary of Agriculture has the authority to release land from CRP without penalty (Stubbs 2014).

The FSA handbook Agricultural Resource Conservation Program 2-CRP (Revision 5) is the most recent policy regarding CRP lands. This handbook indicates that CRP lands may be removed from contracts at no penalty to the landowner when CRP lands are needed for public use. CRP lands temporarily disturbed for construction would need to be reclaimed in coordination with the NRCS. These lands would not be removed from the contract. Where permanent project facilities occupy CRP lands, the acres would be calculated and these lands would be removed from the CRP contract. Annual payments to the landowner would be reduced commensurate with the number of acres removed. The remaining lands in the CRP contract would continue in the contract until renewed or the contract expires (Farm Service Agency 2015b).

Taylor Grazing Act

The Taylor Grazing Act of 1934 provides the basis for the BLM to provide public land for livestock grazing. The BLM and USFS administer and manage livestock grazing through permits and leases issued to qualified applicants, and the extent of grazing allowed on these lands can be affected by factors such as drought, wildfire, and market conditions. The BLM's overall objective in managing livestock grazing on public rangelands is to "…ensure the long-term health and productivity of these lands and to create multiple environmental benefits…" The BLM achieves this objective through use of "rangeland health standards and guidelines" which "…describes specific conditions needed for public land health…" The development and application of these standards and guidelines are to achieve the four fundamentals of rangeland health, identified in Title 43 CFR § 4180.1, including:

- Watersheds are in, or are making significant progress toward properly functioning physical condition, including their upland, riparian wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that is in balance with climate and landform; and maintain or improve water quality, water quantity, and timing and duration of flow.
- Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow are maintained, or there is significant progress toward their attainment, to support healthy biotic populations and communities.
- Water quality complies with state water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives, such as meeting wildlife needs.
- Habitats are, or are making significant progress toward being, restored or maintained for federal threatened and endangered species, federal proposed or candidate threatened and endangered species, and other special status species.

STATE OF OREGON

High-value Farmland and Soils

ORS Chapter 197 directs Oregon counties to develop county comprehensive plans consistent with the applicable statewide planning goals developed by the Land Conservation and Development Commission. Each comprehensive plan is accompanied by a set of implementing measures. The two most common measures are zoning and land-division ordinances. Every city and county in Oregon has adopted such land-use controls. Nineteen statewide planning goals are defined, including three goals that are particularly relevant to siting transmission lines and which are applicable in all five Oregon counties in which the B2H Project would be located. Goal 3 is discussed here as it relates to agriculture in the B2H Project study area, and the other two goals are discussed in Section 3.2.6

Goal 3—Agricultural Lands

Goal 3 is designed to preserve and maintain agricultural lands for farm use. To comply with this goal, an applicant for a site certificate from EFSC must demonstrate compliance with applicable statutes (ORS 215.283 and 215.275) and Land Conservation and Development Commission administrative rules (OAR Chapter 660, Division 33) relating to exclusive farm use (EFU) lands. More information concerning EFU lands is available in the Zoning section.

Division 33 of the Land conservation and Development Commission administrative rules defines “High-Value Farmland” as “land in a tract composed predominantly of soils that are: (A) Irrigated and classified prime, unique, Class I or II; or (B) Not irrigated and classified prime, unique, Class I or II.” In addition to this, high-value farmland includes specified perennials such as vineyards and berries, but not including seed crops such as hay or alfalfa. The BLM contacted the Oregon Department of Agriculture to determine the best way to include an analysis of potential impacts on high-value farmland in this EIS. For simplicity, while still being representative of the potential impacts on high-value farmland, the BLM has taken the advice of a representative with the Oregon Department of Agriculture to disclose impacts on high-value soils, not taking into account land ownership or perennial crops (Department of Land Conservation and Development 2008; J. Johnson, personal communication with author, February 16, 2016).

The Water Code

All water in Oregon is publicly owned. If an individual or entity, such as an agricultural operation, wants to use publicly owned water, they must apply for a permit or right from the Water Resources Department. The water right obtained would specify where the water could be used, where it would come from, and how it could be used. Oregon’s Water Code, similar to other western states, has four fundamental provisions:

- Beneficial purpose without waste: permits for water are granted only if the water will have a beneficial purpose without waste.
- Priority: The principle of prior appropriation applies (i.e., the first entity to obtain a water right has priority to the water in times of shortage).

- Appurtenance: Generally, water rights are attached to lands. For instance, if land is sold, the water rights attached to the land are sold with it. A water right for irrigating a particular section of land cannot be used to irrigate other land.
- Must be used: a water right, as specified in the right, must be used at least once every five years. With five consecutive years of nonuse, the right is forfeited. For instance, if water rights are obtained to water 40 acres, but for five consecutive years only 20 acres are watered, the water right is subject to cancellation.

The Water Resources Commission adopts programs to set policies for managing major river basins to protect existing water rights, as well as restore and preserve aquifers. The river basins the B2H Project runs through include the Umatilla, Grande Ronde, Powder, Malheur, and Owyhee. Basins may be designated "critical groundwater areas" to address water supply, water quality, or thermal issues.

Within the study corridor, the Butter Creek, Stage Gulch, and Ordnance Basalt areas in Morrow and Umatilla Counties and Cow Valley near Vale have all been designated critical groundwater areas. Thus, no new permits can be issued in these areas (Oregon Secretary of State 1991; Oregon Water Resources Department 2006, 2013; Ward 2010).

If the construction of a transmission line were to take irrigated agricultural land out of production for more than five consecutive years, the water rights tied to that piece of land could be reduced or cancelled. If this takes place in a critical groundwater area, these water rights could potentially not be reobtainable in the critical groundwater area.

STATE OF IDAHO

The Idaho Local Land Use Planning Act found in Idaho Code Title 67 Chapter 65 requires city and county governments to define agricultural land. This is accomplished through zoning ordinances and is discussed in Section 3.2.6 Zoning Regulatory Framework (State of Idaho Legislature 2003; Witt and Nemnich 2011).

OREGON COUNTIES

Oregon counties have the authority to develop county comprehensive plans consistent with the statewide planning goals. Implementing measures as part of these comprehensive plans include zoning for agricultural uses such as EFU. For information related to EFU, refer to the Zoning discussion in the Regulatory Framework section of Section 3.2.6.

IDAHO COUNTIES

Idaho in the Idaho Local Land Use Planning Act requires counties to define agricultural land. Regulations governing agricultural land are accomplished through zoning ordinances. For information related to these ordinances and the Owyhee County Comprehensive Plan, refer to the Zoning discussion of Section 3.2.6 Regulatory Framework (State of Idaho Legislature 2003).

3.2.7.3 Issues Identified for Analysis

Issues related to agriculture were raised by the public, Native American tribes and federal and state agencies during scoping. The list below is a summary of the issues identified during scoping and Draft EIS comments that are analyzed in this EIS, as well as issues that must be considered as required by applicable laws or regulations.

- Would there be negative economic effects on agricultural and ranching operations? (Refer to Section 3.2.17)
- How much Exclusive Farm Use land would be affected? (Refer to Section 3.2.6)
- What would be the impacts on agricultural and ranching operations?
- What would be the impacts on irrigated farmland and irrigation water use?
- What would be the effects of spraying herbicides on agricultural crops adjacent to the right-of-way?
- What would be the impacts on prime or unique farmlands and high-value farmlands?
- Do transmission lines pose a danger for agricultural workers? (Refer to Section 3.2.18)

3.2.7.4 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.3 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on agriculture.

Data Sources

Because of comments received on the Draft EIS, the analyses completed for this Final EIS assessment were conducted using the best available spatial data and digitized data using aerial imagery. Data sources include:

- USDA National Agricultural Statistics Service CropScape-Cropland Data Layer;
- Agricultural irrigation as digitized from aerial imagery;
- CAFOs data obtained from the Oregon Department of Agriculture;
- Idaho CAFOs digitized from aerial imagery;
- Boardman Tree Farm as digitized from aerial imagery;
- NRCS SSURGO/STATSGO2 soils data;
- CRP data as analyzed by the USDA Farm Service Agency;
- BLM and USFS livestock grazing allotments; and
- Self-reported dairies.

For purposes of the analysis, the data were classified as follows. Refer also to MV-16 through MV-18.

Existing Agriculture

USDA National Agricultural Statistics Service CropScape-Cropland Data Layer

This dataset is a raster, georeferenced, crop-specific land cover data layer with a resolution of 30 meters. It was created by the USDA National Agricultural Statistics Service using satellite imagery from

the 2015 growing season. It contains information on specific crops growing across the entire B2H Project analysis area. This is representative of one growing season only; it is common for land to be idle one year and in production the next, and also for crops being grown to change annually. For purposes of the socioeconomics analysis and the availability of census data, the individual crops have been classified into the following categories:

- Fallow/Idle Cropland: Fallow Idle Cropland
- Field Crops: alfalfa, barley, camelina, canola, clover/wildflowers, corn, double crop barley/corn, double crop winter wheat/corn, dry beans, durum wheat, hops, millet, mint, mustard, oats, other crops, other hay/non alfalfa, popcorn or corn, rye, sod/grass seed, sorghum, soybeans, spring wheat, sugar beets, sunflower, triticale, and winter wheat
- Fruit and Tree Nuts: apples, apricots, blueberries, cantaloupes, cherries, grapes, nectarines, other tree crops, peaches, pears, plums, and watermelons
- Grass/Pasture: grass/pasture
- Vegetables: asparagus, cabbage, carrots, gourds, greens, herbs, lettuce, miscellaneous vegetables and fruits, onions, peas, peppers, potatoes, pumpkins, radishes, squash, sweet corn, and turnips

Agriculture Irrigation

This data was digitized from aerial imagery using classification methods similar to those used by the USGS. Classification was based solely on image interpretation with no field verification. Errors are likely because of misinterpretation of the imagery and lack of sufficient information to make an informed decision (Buto et al. 2014):

- Center Pivot Irrigation
- Flood Irrigation
- Other Mechanized Irrigation: wheel lines, hand lines, stationary sprinklers, drip irrigation, or residential sprinklers
- Dryland (ground appears to be cultivated, but there is no irrigation equipment readily visible in aerial imagery)

Confined Animal Feeding Operations

- Includes data on CAFOs obtained from the Oregon Department of Agriculture, Idaho CAFOs digitized from aerial imagery, and two self-reported dairies

Tree Farm

- The Boardman Tree Farm data was digitized from aerial imagery.

Important Farmland, High-value soils, and Conservation Reserve Program Lands:

Natural Resources Conservation Service Soil Survey Geographic Database/State Soil Geographic Database Soils Data

This soil types dataset is a compilation produced by the NRCS of the NRCS SSURGO data and the NRCS STATSGO data. This has been used to increase the coverage of inventoried soil types instead

of the SSURGO data, which was used in the Draft EIS. The NRCS has not completed the entire soils inventory for the study corridor, but this is the best available data at this time. In order to report separately on farmland and soils important to agriculture under the Farmland Protection Policy Act and Oregon law, this data has been classified two different ways, as "Important Farmland" and "High-value Soils" (refer to Regulatory Framework Section 3.2.7.2 for more information on these classifications).

Important Farmlands

Prime farmland if irrigated and drained, prime farmland if irrigated, and farmland of statewide importance. Note, other types of farmland listed in the Farmland Protection Policy Act (such as unique farmland) are not located within the 1-mile-wide study corridor as identified with the NRCS SSURGO/STATSGO soils data.

High-Value Soils

High-value soils are composed of irrigated capability classes I-II, nonirrigated capability classes I-II, and prime and unique farmland.

Conservation Reserve Program

Because this data is confidential information managed by the Farm Service Agency, this data is subject to privacy restrictions prohibiting it from being displayed in this document. The BLM was not able to obtain it for use in this analysis. However, the Farm Service Agency completed the analysis for this project and provided the results of potential acreages affected to the BLM. Acres of CRP are disclosed, which includes acres enrolled in the CREP.

Livestock Grazing

Pastures or allotments usually contain a large percentage of public land, but also can contain a large percentage of private land if an allotment is part of a grazing system. Because allotments are defined by fences, topography, or other land features, and not exact ownership boundaries, there are many instances where small parcels or slivers of public land are fenced in with areas outside of allotments. Other allotments are mostly private, but contain some parcel of public land fenced within. While each federal agency manages public lands within these allotments, agencies do not manage private land within the allotment. For purposes of analysis, BLM and USFS grazing allotment data are used as provided by the agencies. Miles crossed of grazing allotments are discussed as a whole rather than separately as private and public lands. Estimated animal unit months (AUMs) affected are disclosed only on federal grazing allotments because impacts occurring on private lands would not impact the public land AUM; however, miles crossed and disturbance acres are for entire allotments, regardless of jurisdiction.

ANALYSIS AREA

The study corridor for agriculture is 1-mile wide (i.e., 0.5 mile on either side of the alternatives and route variations).

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria developed to assess the level of potential effects on agriculture associated with implementation of the B2H Project are presented in Table 3-293. Refer to Sections 3.1.3 and 2.5.1 for information regarding how these criteria are implemented in the analysis process.

Table 3-293. Criteria for Assessing Level of Impacts on Agriculture

Level of Impacts	Description
High	• Areas where the B2H Project would create a direct long-term conflict with agricultural use and ranching operations (e.g., removal of irrigation infrastructure on irrigated farmland, removal of land used for crop production and irrigation, long-term interference with aerial spraying operations, etc.) • Areas where the B2H Project would conflict physically with any designated farmland areas (e.g., high-value soils, important farmland, Conservation Reserve Program) in a manner that would remove the ability to be managed as such • Areas where the B2H Project would conflict with any applicable adopted policy or management goal of the affected land-managing agency
Moderate	• Areas where the B2H Project would create a direct (short-term) and/or an indirect (short- or long-term) conflict with agricultural use and ranching operations (e.g., removal of land used for crop production on dryland farmland) • Areas where the B2H Project would indirectly affect any applicable adopted policy or management goal of the affected land-managing agency
Low	• Areas where land use is compatible with a transmission line (e.g., rangeland and/or grazing allotments) • Areas in which the effects, while long term, would not preclude use of the area for agricultural, ranching, and/or grazing uses • Areas in which effects would be temporary and reversible after construction is concluded • Areas where the B2H Project is located in a designated (federal or local) utility corridor

The impact analysis for important farmland and high-value soils is different than other resources because the high, moderate, and low criteria were not used to assess level of impacts quantitatively as was done for most other resources. Instead, the number of how many miles the B2H Project alternative routes cross these areas is presented, followed by a qualitative discussion (using the high, moderate, and low criteria) of how this crossing may affect these soil types.

Effects Analysis

Assessment of Initial Impacts

To determine initial impacts that could result from implementation of the B2H Project, the levels of potential effects on agriculture resources and operations were assessed based on the compatibility of the agricultural resource with the B2H Project, as reflected in the criteria presented in Table 3-293.

Mitigation Planning and Effectiveness

The POD (Idaho Power Company 2011) includes an Agricultural Protection Plan Framework (POD Appendix H), which would be completed prior to construction for the selected route and would include required mitigation measures to mitigate agricultural impacts**.** The POD would be adopted as a part of the conditions of approval of the right-of-way grant.

Table 2-7 contains design features of the B2H Project for environmental protection, which, as part of the B2H Project description, would be implemented during design and engineering and the construction, and operation and maintenance of the B2H Project. These design features would be implemented for the entirety of the B2H Project and are intended to avoid, minimize, or reduce interference with agricultural resources and operations. These design features include requirements such as reclamation of all construction areas, coordination with land owners for construction timing, salvaging topsoil for revegetation, and avoiding agricultural operations to the extent practicable.

For the selected alternative, individual rights-of-way for the B2H Project on private agricultural lands would be obtained by the Applicant either in fee by deed, or by perpetual easements. Property owners would be compensated for the right-of-way or easement. The Applicant would negotiate damage-related issues with private property owners during the easement acquisition process, such as reductions in the acreage available for cultivation.

The Applicant's Proposed Action Alternative and other alternative routes and route variations considered in the EIS have been sited to follow field boundaries and to avoid agricultural infrastructure to the extent possible. However, there are occasions where a route crosses these areas. If the case for the selected route, the Applicant would work with property owners prior to construction to determine best locations for the transmission line that would reduce impacts on the agricultural operations. The Applicant would negotiate modifications to the transmission line's original design, such as relocating structures or access roads (Idaho Power Company 2015).

B2H Project tower structures and other B2H Project facilities could be micro-sited outside the operational area of irrigation systems to reduce operation impacts. Locations of B2H Project facilities would be coordinated with landowners prior to construction to reduce impacts. For example, the typical span between transmission line structures would be 1300 feet for the B2H Project. Pivots are generally 2640 feet in diameter (half a mile), a distance preventing pivots from being spanned at the center. However, pivots can be spanned on edges using uncultivated pivot corners for locating structures. Although the right-of-way could cross a pivot field, irrigation (and many other agricultural operations) could continue within the right-of-way provided a transmission line structure does not impinge on the irrigation system's operational path (Idaho Power Company n.d.b).

Special access provisions in agricultural areas could be negotiated with the landowner to maintain existing practices. The residual effects disclosed in the Environmental Consequences section does not take into account the results of negotiations between the Applicant and the property owner. Rather, the analysis is based on the reference centerline for the alternatives and route variations and represents the worst case scenario.

Short-term impacts on livestock grazing would be minimized by performing construction activities when calving and lambing is not occurring and avoiding calving and lambing areas in the B2H Project right-of-way and/or in associated ancillary facilities. Long-term impacts on these calving and lambing operations would be low due to the minimal extent of disturbance on these calving and lambing areas from operation and maintenance. Construction timing stipulations for the selected alternative route will be

addressed in the POD. The Applicant would coordinate construction timing with affected landowners to minimize impacts on crop production.

All existing improvements, such as fences, gates, irrigation ditches, cattle guards, and reservoirs, would be maintained during construction and if damaged, would be repaired to preconstruction conditions or better. If pipelines or canals transporting water for livestock, wildlife, and crops are damaged by construction activities, the Applicant would repair them to landowner or land-managing agency specifications.

In addition to these design features, selective mitigation measures (refer to Table 2-13) would be applied in specific locations along the B2H Project to further reduce high or moderate initial impacts on agricultural resources and operations. The selective mitigation measures that would be applied to reduce impacts on agricultural resources and operations include:

- **Mitigation Measure 5 (Minimize Clearing for Operational Clearances)** This mitigation measure would be implemented wherever crop production or tree farms occur. It involves limiting vegetation disturbance within the right-of-way, except as needed for structure or conductor clearances. This would reduce production losses and maintain topsoil for agricultural purposes.
- **Mitigation Measure 6 (Limit New or Improved Accessibility to Areas Previously Inaccessible)** This mitigation measure would be implemented wherever crop production, tree farms, CAFOs, irrigated farmland, and CRP lands occur. It would require the Applicant to restore all newly created or improved access roads to their natural contour and vegetation. This would reduce long-term interference with agricultural operations following construction.
- **Mitigation Measure 8 (Span and/or Avoid Sensitive Features)** This mitigation measure would be implemented wherever crop production, tree farms, CAFOs, irrigated farmland, and CRP lands occur. It involves spanning agricultural land, selectively placing structures to avoid agricultural land, and realigning the centerline to be more compatible with agricultural operations and resources.

Residual Impacts

Residual impacts are those impacts on agricultural resources and operations that would remain despite the design features of the B2H Project for environmental protection, the Agricultural Protection Plan Framework in the POD and after the implementation of the selective mitigation measures. Table 3-294 presents the estimated level of residual impacts after implementation of selective mitigation measures.

Table 3-294. Summary of Initial and Residual Impacts on Agriculture			
Resource	**Initial Impacts**	**Selective Mitigation Measures Applied**	**Residual Impacts**
Existing Agriculture			
Confined Animal Feeding Operation	High	6,8	Low
Tree farms	High	5,6,8	High
Crop Production			
Field Crops	High	5,6,8	Moderate
Fruit and Tree Nuts	High	5,6,8	Moderate
Grass/Pasture	Moderate	6,8	Low
Vegetables	High	5,6,8	Moderate
Fallow/Idle Land	High	5,6,8	Moderate
Irrigation Types			
Dryland	Low	Not applicable	Low
Center Pivot	High	6,8	High
Other Mechanized	High	6,8	Moderate
Flood	High	6,8	Moderate
Protected Agriculture			
High-value soils	Not applicable	Not applicable	Not applicable
Conservation Reserve Program Lands	High	5,6,8	High
Grazing			
Grazing Allotments	Low	Not applicable	Low

While B2H Project structures could displace agricultural uses for the life of the B2H Project, the construction activities themselves may not affect all long-term agriculture. Operations of the B2H Project could permanently occupy the lands on which permanent B2H Project facilities are constructed, but most agricultural activities could continue within the right-of-way. The property owner could use the right-of-way as desired, subject to the negotiated terms in the easement agreement with the Applicant. Uses that would obstruct or impair the Applicant's ability to access the transmission line for maintenance would not be permitted (Idaho Power Company 2015).

Residual impacts on rangeland within grazing allotments crossed by the Proposed Action or alternatives would be low after the application of design features (refer to Table 2-7), which would include vegetation reclamation. In addition, during construction and maintenance, the Applicant would coordinate their activities with the BLM, USFS, other land-managing agencies, and/or private landowners.

Additional Analysis

In additional to the analysis described previously in this section, the construction disturbance and long-term surface disturbance of existing agriculture, important and high-value soils, and livestock grazing was estimated to allow comparison of alternatives and route variations. The estimation methods are described in Section 2.5.1 and are based on the B2H Project description and typical characteristics of a 500-kV transmission line presented in Chapter 2.

3.2.7.5 AFFECTED ENVIRONMENT

The section describes the existing condition of agriculture in the study corridor that could be affected by implementing the B2H Project. Refer also to MV-16, MV-17, and MV-18 in the Map Volume.

SEGMENT 1—MORROW-UMATILLA

Existing Agriculture

Segment 1 is the most agriculturally intensive segment in the B2H Project area. A variety of crops are grown in the region ranging from field crops such as alfalfa and corn, to fruit and tree nuts such as blueberries and cherries, to vegetables such as onions, peas, and peppers. Additionally, CAFOs are present, and an additional CAFO (not included in Table 3-295) is being constructed. There are three critical groundwater areas, including the Ordnance Basalt, Stage Gulch, and Butter Creek critical groundwater areas. This area is an excellent location for agriculture because of high-quality soils, low cost water, proximity to processing facilities, and flat topography.

Table 3-295. Inventory Data for Crop Types in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Crop Type Crossed (acres)						Confined Animal Feeding Operations (count)[3]
		Fallow/Idle Cropland[1]	Field Crops[1]	Fruit and Tree Nuts[1]	Grass/ Pasture[1]	Vegetables[1]	Tree Farms[2]	
Applicant's Proposed Action	91.9	7,501	12,512	32	1,832	1,582	595	0
Variation S1-B1	*6.4*	*0*	*0*	*0*	*81*	*0*	*0*	*0*
Variation S1-B2	*6.4*	*0*	*0*	*0*	*88*	*0*	*0*	*0*
East of Bombing Range Road	92.3	7,506	12,684	35	1,877	1,681	663	0
Applicant's Proposed Action – Southern Route	99.1	6,252	12,570	31	1,547	1,579	595	0
West of Bombing Range Road – Southern Route	95.6	4,987	6,489	33	1,586	1,469	595	0
Longhorn	88.2	6,405	10,731	719	2,251	1,532	3,642	2
Interstate 84	84.7	5,808	10,661	394	1,949	2,920	1,135	3
Variation S1-A1	*18.5*	*2,792*	*4,113*	*0*	*38*	*570*	*0*	*1*
Variation S1-A2	*18.5*	*1,374*	*1,283*	*6*	*51*	*234*	*0*	*1*
Interstate 84 – Southern Route	93.4	4,680	10,752	394	1,666	2,918	1,135	3

Table Notes:
These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the U.S. Department of Agriculture CropScape
[2]Data source is the Boardman Tree Farm as digitized from aerial imagery
[3]Data source is the Oregon Department of Agriculture confined animal feeding operations and self-reported dairies.

The Boardman Tree Farm is located in the affected environment of Segment 1. This 25,000-acre farm grows hybrid poplars for lumber and wood chips, with approximately 600 trees per acre. The farm is irrigated with more than 9,000 miles of drip irrigation. A sawmill is located near the center of the farm,

which processes 2,000 acres of the trees each year (Amusing Planet 2013). The Boardman Tree Farm was recently sold and is being turned into irrigated agriculture and a dairy (Harbarger 2016). Because our data does not identify where this is occurring, the impacts discussed will be impacts on the Boardman Tree Farm as it currently exists in our data. However, the results are conservative in that they overestimate, rather than underestimate potential effects. In other words, impacts on the Boardman Tree Farm from the B2H Project would be greater than impacts on irrigated agriculture and a dairy because tree crops cannot be cultivated within the right-of-way.

Most of the cropland in the study corridor in Morrow and Umatilla counties is sprayed annually. An estimated 60 percent of spraying is applied aerially; 40 percent is applied by ground. More than 90 percent of the aerial spraying is performed by fixed-wing aircraft; 10 percent is applied by helicopter.

Table 3-295 identifies crops and CAFOs in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 1. Refer also to MV-16. There also are extensive tracts of irrigated farmland in the study corridor for Segment 1, including center pivot, flood, and other mechanized irrigation types. Dryland farming (i.e., no irrigation) also occurs in Segment 1 (refer to Table 3-296).

Table 3-296. Inventory Data for Irrigation Types in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Center Pivot Count
Applicant's Proposed Action	91.9	20,751	4,928	1,206	1,192	84
Variation S1-B1	*6.4*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*6.4*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	92.3	20,980	4,910	1,206	1,181	81
Applicant's Proposed Action – Southern Route	99.1	21,024	4,664	927	1,137	78
West of Bombing Range Road – Southern Route	95.6	10,942	3,675	89	1,263	66
Longhorn	88.2	16,809	4,914	1,206	4,084	81
Interstate 84	84.7	10,674	7,801	2,259	1,959	164
Variation S1-A1	*18.5*	*5,025*	*2,205*	*274*	*4*	*38*
Variation S1-A2	*18.5*	*1,499*	*876*	*290*	*250*	*17*
Interstate 84 – Southern Route	93.4	11,548	7,536	2,041	1,904	159

Table Note: Data source for this table includes cultivated farmland classified as dryland or as an irrigation type digitized from aerial imagery within the B2H Project 1-mile-wide study corridor for each alternative and variation. Center pivot count includes partial or full pivots within the 1-mile-wide study corridor for each alternative and variation.

Applicant's Proposed Action Alternative

The most common crop types in the study corridor for the Applicant's Proposed Action Alternative are field crops and fallow or idle farmland. Also present in the study corridor are grasslands/pasture, vegetable farming operations, orchards of fruit and tree nuts, and tree farms. No CAFOs are operating in the study corridor. Most irrigated farmland in the study corridor is irrigated by center pivot irrigation. There are 84 center pivots in the study corridor. Some irrigated farmland is irrigated with flood or other mechanized irrigation. The majority of cultivated farmland in the study corridor is dryland.

Variations S1-B1 and S1-B2

Only grassland/pasture is present in the study corridor; none of which is irrigated (refer to Tables Table 3-295 and Table 3-296). No CAFOs are present in the study corridor for these route variations.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The study corridor for the additional action along Bombing Range Road is similar to the study corridor for the Applicant's Proposed Action Alternative. The affected environment for the Design Option 1 additional action is a combination of those described for the Applicant's Proposed Action Alternative and the East of Bombing Range Road Alternative (described below). Refer to Figures 2-20 b and 2-20 c for a graphic portrayal of the Design Option 1 additional action.

Design Option 2

The study corridor and affected environment for the additional action along Bombing Range Road is similar to the study corridor for the East of Bombing Range Road Alternative (discussed below). In addition, the affected environment and study corridor extends to the east at the southern portion of Bombing Range Road where the road turns slightly to the east.

Design Option 3

The study corridor and affected environment for the additional action along Bombing Range Road is similar to the study corridor for the East of Bombing Range Road Alternative (below). In addition, the affected environment and study corridor extends to the east at the southern portion of Bombing Range Road where the road turns slightly to the east. The study corridor and affected environment also includes the area south east of the NWSTF Boardman where a new substation would be located as part of this option. This area includes dryland farmland.

East of Bombing Range Road Alternative

Similar to the Applicant's Proposed Action Alternative, the most common crop types in the study corridor for the East of Bombing Range Road Alternative are field crops and fallow or idle farmland. Also present in the study corridor are grasslands/pasture, vegetable farming operations, orchards of fruit and tree nuts, and tree farms. No CAFOs are operating in the study corridor. Most irrigated farmland in the study corridor is irrigated by center pivot irrigation. There are 81 center pivots in the study corridor. Some irrigated farmland is irrigated with flood or other mechanized irrigation. The majority of cultivated farmland in the study corridor is dryland.

Applicant's Proposed Action – Southern Route Alternative

Similar to the Applicant's Proposed Action Alternative, the most common crop types in the study corridor are field crops and fallow or idle farmland. Also present in the study corridor are grassland/pasture, vegetable farming operations, orchards for fruit and tree nuts, and tree farms. No CAFOs are operating in the study corridor. Most irrigated farmland in the study corridor is irrigated by center pivot irrigation. There are 78 center pivots in the study corridor. Some irrigated farmland is irrigated with flood or other mechanized irrigation. The majority of cultivated farmland in the study corridor is dryland.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The affected environment for this alternative is similar to the Applicant's Proposed Action Alternative. In comparison, there is less irrigated farmland irrigated by center pivots. There are 66 center pivots in the study corridor for this alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

Longhorn Alternative

Similar to the Applicant's Proposed Action Alternative, the most common crop types in the study corridor for the Longhorn Alternative are field crops and fallow or idle farmland. There is more grassland/pasture in the study corridor for this alternative than other alternatives in Segment 1. Also present are vegetable farming operations orchards for fruit and tree nuts, and more tree farms than any other alternative or route variation in Segment 1. Two large, concentrated CAFOs (as defined by 40 CFR 122.23) are operating in the study corridor for this alternative. One CAFO has 3,000 dairy animals permitted; one CAFO has 8,700 dairy animals permitted. There is a third CAFO that is currently under construction with an unknown number of dairy animals permitted.

Most irrigated farmland in the study corridor is irrigated by center pivot irrigation. There are 81 center pivots in the study corridor. The tree farms are irrigated by drip systems (categorized in data as 'other mechanized' irrigation). Flood irrigation also is used to irrigate some farmland in the study corridor. The majority of cultivated farmland in the study corridor is dryland.

Interstate 84 Alternative

The most common crop types present in the study corridor are field crops and fallow/idle farmland. Also present in the study corridor are grassland/pasture, vegetable farming operations, orchards of fruit and tree nuts, and tree farms.

Three CAFOs are operating in the study corridor for this alternative. These CAFOs are large concentrated operations and are permitted for 6,000 animals of unknown type; 8,000 animals of unknown type; and 12,900 dairy cattle. Most irrigated farmland in the study corridor is irrigated by center pivot irrigation or flood irrigation. There are more pivot- and flood-irrigated acres in this alternative study corridor than in any other alternative study corridor. Also present in the study corridor are 164 pivots. There is some farmland in the study corridor irrigated by other mechanized irrigation. The majority of cultivated farmland in the study corridor is dryland.

Variation S1-A1

The most common crop types in the study corridor are field crops and fallow/idle farmland. Also present in the study corridor is grassland/pasture, and vegetable operations. This variation has twice the fallow/idle farmland, three times the field crops, and more than twice the vegetable operations in the study corridor compared to Variation S1-A2. One CAFO is operating in the study corridor for this variation, which is a large concentrated operation permitted for 12,900 dairy cattle. There are more than three times the acres of dryland farmland and nearly three times the acres of center pivot-irrigated farmland compared to Variation S1-A2. There are more than twice the center pivots in the study corridor as Variation S1-A2.

Variation S1-A2

The most common crop types in the study corridor are field crops and fallow/idle farmland. Unlike Variation S1-A1, this variation has orchards of fruit and tree nuts growing in the study corridor. There is more grassland/pasture than Variation S1-A1. One CAFO is operating in the study corridor for this alternative, which is a large concentrated operation permitted for 4,150 animals of unknown type. There are more acres of flood and other mechanized irrigation in the study corridor, and less than half the number of pivots as Variation S1-A2.

Interstate 84 – Southern Route Alternative

The most common crop types in the study corridor are field crops and fallow/idle farmland. There also is grassland/pasture, vegetable operations, orchards of fruit and tree nuts, and tree farms growing. The same three CAFOs operating in the study corridor for this alternative are in the study corridor for the Interstate 84 Alternative. The most common irrigation methods are center pivot irrigation or flood irrigation. Crop types and irrigated farmland within the study corridor are similar to the Interstate 84 Alternative, with the exception that there are fewer acres of fallow/idle cropland and fewer center pivots within the study corridor.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

Segment 1 contains prime farmland if irrigated, farmland of statewide importance, and high-value soils. No prime farmland or unique farmland is present in this study corridor for the alternatives and route variations in Segment 1. Table 3-297 identifies the important farmland and high-value soils in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 1. Refer also to MV-17.

Table 3-297. Inventory Data for Important Farmland and High-Value Soils in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Important Farmland (acres)		High-Value Soils[3] (acres)
		Prime Farmland if Irrigated[1, 2]	Farmland of Statewide Importance[1]	
Applicant's Proposed Action	91.9	17,874	22,587	18,077
Variation S1-B1	*6.4*	*0*	*22*	*0*
Variation S1-B2	*6.4*	*0*	*25*	*0*
East of Bombing Range Road	92.3	18,000	22,657	18,209
Applicant's Proposed Action – Southern Route	99.1	15,673	26,442	15,860
West of Bombing Range Road – Southern Route	95.6	12,847	21,571	12,979
Longhorn	88.2	13,907	22,213	14,072
Interstate 84	84.7	16,609	14,457	17,090
Variation S1-A1	*18.5*	*8,706*	*2,220*	*8,748*
Variation S1-A2	*18.5*	*3,185*	*5,049*	*3,237*
Interstate 84 – Southern Route	93.4	14,858	18,767	15,322

Table Notes:

These are for resource inventory within the B2H Project 1-mile-wide study corridor.

[1]Data source is the Natural Resource Conservation Service SSURGO/STATSGO2 soils data.

[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained.

[3]Data source is the Natural Resource Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Also, lands enrolled in the USDA CRP are present in Segment 1. CRP data were not available in a format to allow an inventory for each alternative and route variation in Segment 1. Rather, data were available by county (refer to Table 3-298). Of all counties in Oregon, Umatilla County had the most acres enrolled in the CRP during the last ten years, followed by Morrow County. In 2014, the CRP acres in these two counties were greater than the CRP acres in all other Oregon counties combined (Farm Service Agency 2014).

Table 3-298. County Conservation Reserve Program Acres Enrolled 2010-2014 in Segment 1—Morrow-Umatilla

County	2010	2011	2012	2013	2014
Morrow	118,887	119,139	116,364	116,156	114,422
Umatilla	150,377	150,413	149,475	151,020	161,490
Union	9,784	9,609	9,108	9,222	8,992

Table Note: Data is sourced from the U.S. Department of Agriculture Farm Service Agency Conservation Program index at http://www.fsa.usda.gov/programs-and-services/conservation-programs/reports-and-statistics/conservation-reserve-program-statistics/index.

Applicant's Proposed Action Alternative

Table 3-297 identifies the extent of important farmland and high-value soils present in the study corridor for the Applicant's Proposed Action Alternative. Farmlands present in the study corridor include prime farmland if irrigated, and farmland of statewide importance, in addition to high-value soils.

Variations S1-B1 and S1-B2

Prime farmland if irrigated and high-value soils are not present in the study corridor for these route variations. Variation S1-B2 has more farmland of statewide importance in the study corridor than Variation S1-B1.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The study corridor for the additional action along Bombing Range Road is similar to the study corridor for the Applicant's Proposed Action Alternative. The affected environment for the design option one additional action is a combination of those described for the Applicant's Proposed Action Alternative and the East of Bombing Range Road Alternative (described below).

Design Option 2

The study corridor and affected environment for the additional action along Bombing Range Road is similar to the study corridor for the East of Bombing Range Road Alternative (discussed below). In addition, the affected environment and study corridor extends to the east at the southern portion of Bombing Range Road where the road turns slightly to the east.

Design Option 3

The study corridor and affected environment for the additional action along Bombing Range Road is similar to the study corridor for the East of Bombing Range Road Alternative (below). In addition, the affected environment and study corridor extends to the east at the southern portion of Bombing Range Road where the road turns slightly to the east. The study corridor and affected environment also includes the area south east of the NWSTF Boardman where a new substation would be located as part of this option. This area has high-value soils and important farmland present.

East of Bombing Range Road Alternative

Similar to the Applicant's Proposed Action Alternative, important farmland and high-value soils are present in the study corridor for the East of Bombing Range Road Alternative; however, more important farmland, farmland of statewide importance, and high-value soils are present in the study corridor for this alternative than any other alternatives or route variations in Segment 1 (refer to Table 3-297**)**.

Applicant's Proposed Action – Southern Route Alternative

Similar to the Applicant's Proposed Action Alternative, important farmland, farmland of statewide importance, and high-value soils are present in the study corridor for the Applicant's Proposed Action Alternative – Southern Alternative. There are fewer acres of prime farmland if irrigated and high-value soils, but more acres of farmland of statewide importance than the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The affected environment for this alternative route is similar to the Applicant's Proposed Action Alternative. There is less prime farmland if irrigated and high-value soils in the study corridor for this alternative than the study corridor of other alternatives and route variations in Segment 1.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

Longhorn Alternative

Similar to the Applicant's Proposed Action Alternative, prime farmland if irrigated, farmland of statewide importance, and high-value soils are present in the study corridor for the Longhorn Alternative, but there are fewer acres of each present in the Longhorn Alternative study corridor.

Interstate 84 Alternative

Prime farmland if irrigated, farmland of statewide importance, and high-value soils are present in the study corridor of the Interstate 84 Alternative, but there are fewer acres of each present in the Interstate 84 Alternative study corridor than are present in the Applicant's Proposed Action Alternative.

Variation S1-A1

An additional 5,521 acres of prime farmland if irrigated and high-value soils are present in the study corridor compared to Variation S1-A2.

Variation S1-A2

An additional 2,829 acres of farmland of statewide importance are present in the study corridor compared to Variation S1-A1.

Interstate 84-Southern Route Alternative

Prime farmland if irrigated, farmland of statewide importance, and high-value soils are present in the corridor, but there are fewer acres of each present in the Interstate 84-Southern Route Alternative study corridor than are present in the Applicant's Proposed Action Alternative.

Livestock Grazing

This section examines grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 1. Grazing allotments relevant to Segment 1 include Five Points and Spring Creek (managed by the USFS) and Butter, Snipe Cr, Sparks, and Ward Butte (managed by the BLM). Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Note that while this discussion is identifying all allotments within a half mile of the alternative routes and variations, Appendix G identifies only those allotments actually crossed by the alternative routes and variations, which is why allotments may be included here, but not listed in the appendix as being affected by the B2H Project.

Table 3-299 identifies the BLM- and USFS-administered grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternative and route variations in Segment 1. Refer also to MV-18.

Table 3-299. Inventory Data for Grazing Allotments in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office and/or National Forest	Number of Allotments Crossed[1,2]	Active Animal Unit Month[1,3]	Total Allotment Acres[1,4]	Acres in the Study Corridor[1,5]
Applicant's Proposed Action	91.9	Baker Field Office Wallowa-Whitman	1 3	24 4,843	24,902 44,678	2 2,831
Variation S1-B1	*6.4*	*Baker Field Office* *Wallowa-Whitman*	*1* *3*	*24* *4,843*	*24,902* *44,678*	*2* *2,831*
Variation S1-B2	*6.4*	*Baker Field Office* *Wallowa-Whitman*	*1* *3*	*24* *4,843*	*24,902* *44,678*	*35* *2,826*
East of Bombing Range Road	92.3	Baker Field Office Wallowa-Whitman	1 3	24 4,843	24,902 44,678	2 2,831
Applicant's Proposed Action – Southern Route	99.1	Baker Field Office Wallowa-Whitman	1 3	24 4,843	24,902 44,678	2 2,831
West of Bombing Range Road – Southern Route	95.6	Baker Field Office Wallowa-Whitman	1 3	24 4,843	24,902 44,678	2 2,831
Longhorn	88.2	Baker Field Office Wallowa-Whitman	1 3	24 4,843	24,902 44,678	2 2,831
Interstate 84	84.7	Baker Field Office Wallowa-Whitman	2 3	36 4,843	36,166 44,678	960 2,831
Variation S1-A1	*18.5*	*Not applicable*	*0*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*18.5*	*Not applicable*	*0*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	93.4	Baker Field Office Wallowa-Whitman	2 3	36 4,843	36,166 44,678	960 2,831

Table Notes:
[1]Data source is U.S. Forest Service and the Bureau of Land Management grazing allotments datasets.
[2]Number of allotments crossed by the B2H Project 1-mile-wide study corridor.
[3]Active animal unit months of allotments crossed by the B2H Project 1-mile-wide study corridor.
[4]Total acres of allotments that are crossed by the B2H Project 1-mile-wide study corridor (including areas of allotments outside of the study corridor).
[5]Acres of allotments present in the B2H Project 1-mile-wide study corridor.

Applicant's Proposed Action Alternative

Table 3-299 identifies 4 grazing allotments in the study corridor for the Applicant's Proposed Action Alternative.

Variation S1-B1

The affected environment for grazing allotments for this route variation is the same as the Applicant's Proposed Action Alternative (refer to Table 3-299).

Variation S1-B2

The same grazing allotments are present within the study corridor for this route variation; however, fewer acres of USFS grazing allotments are present in the study corridor than the study corridor for Variation S1-B1.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The study corridor for the additional action along Bombing Range Road is similar to the study corridor for the Applicant's Proposed Action Alternative. The affected environment for the Design Option 1 additional action is a combination of those described for the Applicant's Proposed Action Alternative and the East of Bombing Range Road Alternative (described below). Refer to Figures 2-22b and 2-22c for a graphic portrayal of the Design Option 1 additional action.

Design Option 2

The study corridor and affected environment for this design option of the additional action along Bombing Range Road is similar to the study corridor for the East of Bombing Range Road Alternative (discussed below). In addition, the affected environment and study corridor extends to the east at the southern portion of Bombing Range Road where the road turns slightly to the east.

Design Option 3

The study corridor and affected environment for this design option of the additional action along Bombing Range Road is similar to the study corridor for the East of Bombing Range Road Alternative (below). In addition, the affected environment and study corridor extends to the east at the southern portion of Bombing Range Road where the road turns slightly to the east. The study corridor and affected environment also includes the area south east of the NWSTF Boardman where a new substation would be located as part of this option. This area includes dryland farmland.

East of Bombing Range Road Alternative

The affected environment for grazing allotments for this alternative is the same as the Applicant's Proposed Action Alternative (refer to Table 3-299).

Applicant's Proposed Action – Southern Route Alternative

The affected environment for grazing allotments for this alternative is the same as the Applicant's Proposed Action Alternative (refer to Table 3-299).

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The affected environment for grazing allotments for this alternative is the same as the Applicant's Proposed Action Alternative (refer to Table 3-299).

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The affected environment for grazing allotments for this alternative is the same as the Applicant's Proposed Action Alternative (refer to Table 3-299).

Interstate 84 Alternative

The study corridor for the Interstate 84 Alternative contains the most acres of BLM- and USFS-administered grazing allotments in Segment 1. 5 grazing allotments are present in the study corridor for this alternative route (refer to Table 3-299).

Variations S1-A1 and S1-A2

No BLM- or USFS-administered grazing allotments are present in the study corridor for these route variations.

Interstate 84 – Southern Route Alternative

The affected environment for grazing allotments for this alternative is the same as the Interstate 84 Alternative (refer to Table 3-299).

SEGMENT 2—BLUE MOUNTAINS

Existing Agriculture

This section describes existing crops, irrigated agriculture, CAFOs, and tree farms in Segment 2. Existing agriculture present in Segment 2 includes fallow/Idle cropland, field crops, and grassland/pasture. There are no orchards of fruit and tree nuts, vegetable operations, tree farms, or CAFOS present. There are no critical groundwater areas, but water rights are still obtained by farmers for irrigation. Data are not available to indicate how much land is sprayed with pesticides, but it is anticipated that all cultivated land could be sprayed.

Table 3-300 identifies crops in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 2. Refer also to MV-16.

Table 3-300. Inventory Data for Crop Types in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Crop Type Crossed (acres)						Confined Animal Feeding Operations (count)[3]
		Fallow/Idle Cropland[1]	Field Crops[1]	Fruit and Tree Nuts[1]	Grass/ Pasture[1]	Vegetables[1]	Tree Farms[2]	
Applicant's Proposed Action	33.8	79	810	0	24	0	0	0
Variation S2-A1	*2.8*	*0*	*1*	*0*	*6*	*0*	*0*	*0*
Variation S2-A2	*2.9*	*0*	*1*	*0*	*3*	*0*	*0*	*0*
Variation S2-B1	*3.7*	*0*	*9*	*0*	*1*	*0*	*0*	*0*
Variation S2-B2	*3.8*	*0*	*34*	*0*	*2*	*0*	*0*	*0*
Variation S2-C1	*9.3*	*0*	*37*	*0*	*12*	*0*	*0*	*0*
Variation S2-C2	*8.8*	*0*	*13*	*0*	*43*	*0*	*0*	*0*
Variation S2-E1	*2.3*	*0*	*5*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*2.6*	*0*	*49*	*0*	*0*	*0*	*0*	*0*
Variation S2-F1	*12.1*	*79*	*700*	*0*	*1*	*0*	*0*	*0*
Variation S2-F2	*12.2*	*5*	*184*	*0*	*0*	*0*	*0*	*0*
Glass Hill	33.7	79	809	0	23	0	0	0
Variation S2-D1	*4.3*	*0*	*16*	*0*	*2*	*0*	*0*	*0*
Variation S2-D2	*4.1*	*0*	*1*	*0*	*1*	*0*	*0*	*0*
Mill Creek	34.0	7	679	0	21	0	0	0

Table Notes:
These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the U.S. Department of Agriculture CropScape
[2]Data source is the Boardman Tree Farm as digitized from aerial imagery
[3]Data source is the Oregon Department of Agriculture confined animal feeding operations and self-reported dairies.

Table 3-301. Inventory Data for Irrigation Types in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Center Pivot Count
Applicant's Proposed Action	33.8	9	272	280	115	5
Variation S2-A1	*2.8*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*2.9*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*3.7*	*0*	*0*	*0*	*34*	*0*
Variation S2-B2	*3.8*	*0*	*0*	*0*	*34*	*0*
Variation S2-C1	*9.3*	*0*	*0*	*0*	*0*	*0*
Variation S2-C2	*8.8*	*0*	*0*	*0*	*0*	*0*
Variation S2-E1	*2.3*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*2.6*	*0*	*0*	*0*	*0*	*0*
Variation S2-F1	*12.1*	*9*	*272*	*280*	*0*	*5*
Variation S2-F2	*12.2*	*22*	*43*	*98*	*0*	*1*

Table 3-301. Inventory Data for Irrigation Types in Segment 2—Blue Mountains						
Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Center Pivot Count
Glass Hill	33.7	9	272	280	115	5
Variation S2-D1	*4.3*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*4.1*	*0*	*0*	*0*	*0*	*0*
Mill Creek	34.0	263	43	103	0	1

Table Note: Data source for this table includes cultivated farmland classified as dryland or as an irrigation type digitized from aerial imagery within the B2H Project 1-mile-wide study corridor for each alternative and variation. Center pivot count includes partial or full pivots within the 1-mile-wide study corridor for each alternative and variation.

There also is irrigated farmland in the study corridor for Segment 2, including center pivot, flood, and other mechanized irrigation types. Dryland farming (i.e., no irrigation) also occurs in Segment 2 (refer to Table 3-301).

Applicant's Proposed Action Alternative

The most common crop types in the study corridor for the Applicant's Proposed Action Alternative are field crops and fallow or idle farmland. Also present in the study corridor are grasslands/pasture. Most irrigated farmland in the study corridor is irrigated by center pivot and flood irrigation. There are 5 center pivots in the study corridor. In addition, some farmland is dryland.

Variations S2-A1, S2-A2, S2-B1, S2-B2, S2-C1, S2-C2, S2-E1, S2-E2, S2-F1, and S2-F2

All of these route variations have similar crops present in the study corridor, though Variation S2-F1 and Variation S2-F2 have more field crops present than the other route variations. Similarly, Variations S2-F1 and S2-F2 are the only route variations with irrigated farmland present in the study corridor. Variation S2-F1 has 5 pivots in the study corridor, and S2-F2 has 1 pivot within the study corridor.

Glass Hill Alternative

The Glass Hill Alternative has similar crops present in the study corridor as the Applicant's Proposed Action Alternative. Also, it has the same irrigated farmland in the study corridor as the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

Variation S2-D1 has more acres of field crops present in the study corridor. The route variations do not have irrigated farmland present in the study corridor.

Mill Creek Alternative

This alternative has the same types of crops as the Applicant's Proposed Action Alternative, but has fewer acres present in the study corridor. This alternative has fewer acres of center pivot irrigation, but has more dryland farming than the Applicant's Proposed Action Alternative. This alternative has 1 pivot present in the study corridor.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

Segment 2 contains prime farmland if irrigated, farmland of statewide importance, and high-value soils. No prime farmland or unique farmland is present in this study corridor for the alternatives and route variations in Segment 2. Table 3-302 identifies the important farmland and high-value soils in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 2. Refer also to MV-17.

Table 3-302. Inventory Data for Important Farmland and High-Value Soils in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Important Farmland (acres)		High-Value Soils[3] (acres)
		Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	
Applicant's Proposed Action	33.8	1,769	10,510	1,840
Variation S2-A1	*2.8*	*0*	*430*	*0*
Variation S2-A2	*2.9*	*0*	*239*	*0*
Variation S2-B1	*3.7*	*0*	*1,523*	*68*
Variation S2-B2	*3.8*	*0*	*1,531*	*77*
Variation S2-C1	*9.3*	*0*	*5,489*	*0*
Variation S2-C2	*8.8*	*0*	*4,902*	*0*
Variation S2-E1	*2.3*	*0*	*894*	*0*
Variation S2-E2	*2.6*	*32*	*982*	*32*
Variation S2-F1	*12.1*	*1,731*	*2,436*	*1,731*
Variation S2-F2	*12.2*	*876*	*2,031*	*876*
Glass Hill	33.7	1,769	10,857	1,852
Variation S2-D1	*4.3*	*0*	*2,708*	*0*
Variation S2-D2	*4.1*	*0*	*2,693*	*0*
Mill Creek	34.0	928	9,311	1,027

Table Notes:

These are for resource inventory within the B2H Project 1-mile-wide study corridor.

[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data.

[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained.

[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Also, lands enrolled in the USDA CRP are present in Segment 2. CRP data were not available in a format to allow an inventory for each alternative and route variation in Segment 2. Rather, data were available by county (refer to Table 3-303). In 2014, there were several thousand acres of CRP lands in counties crossed by alternative routes and segments in Segment 2, but no CRP lands are crossed by alternatives in Segment 2.

Table 3-303. County Conservation Reserve Program Acres Enrolled 2010-2014 in Segment 2—Blue Mountains					
County	**2010**	**2011**	**2012**	**2013**	**2014**
Union	9,784	9,609	9,108	9,222	8,992
Baker	5,223	5,280	5,378	5,385	5,327
Table Note: Data is sourced from the U.S. Department of Agriculture Farm Service Agency Conservation Program index at http://www.fsa.usda.gov/programs-and-services/conservation-programs/reports-and-statistics/conservation-reserve-program-statistics/index.					

Applicant's Proposed Action Alternative

Farmlands present in the study corridor include prime farmland if irrigated, and farmland of statewide importance, in addition to high-value soils. This alternative route has the most prime farmland if irrigated in the study corridor of any alternative route in Segment 2.

Variations S2-A1 and S2-A2

Variation S2-A1 has more farmland of statewide importance present in the study corridor than Variation S2-A2. Neither variation has prime farmland if irrigated or high-value soils present in the study corridor.

Variations S2-B1 and S2-B2

Variation S2-B2 has more farmland of statewide importance and high-value soils present in the study corridor than Variation S2-B1. Neither variation has prime farmland if irrigated present in the study corridor.

Variations S2-C1 and S2-C2

Variation S2-C1 has more farmland of statewide importance present in the study corridor than Variation S2-C2. Neither variation has prime farmland if irrigated or high-value soils present in the study corridor.

Variations S2-E1 and S2-E2

Variation S2-E2 has more farmland of statewide importance, prime farmland if irrigated, and high-value soils present in the study corridor than Variation S2-E2.

Variations S2-F1 and S2-F2

Variation S2-F1 has more farmland of statewide importance, prime farmland if irrigated, and high-value soils present in the study corridor than Variation S2-F2.

Glass Hill Alternative

This alternative route is similar to the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

Variation S2-D1 has more farmland of statewide importance present in the study corridor. Neither variation has prime farmland if irrigated or high-value soils present in the study corridor.

Mill Creek Alternative

This alternative has farmland of statewide importance, prime farmland if irrigated, and high-value soils present in the corridor. It crosses the least important farmland and high-value soils of all alternatives in Segment 2.

Livestock Grazing

This section examines grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 2. Grazing allotments relevant to Segment 2 include Five Points and Spring Creek, (managed by the USFS) Ladd Canyon, Riverdale Hill, Rock Creek Road, Seven Diamond No. 3, and Tamarack Mountain (managed by the BLM). Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Note that while this discussion is identifying all allotments within a half mile of the alternative routes and variations, Appendix G identifies only those allotments actually crossed by the alternative routes and variations, which is why allotments may be included here, but not listed in the appendix as being affected by the B2H Project.

Table 3-304 identifies the BLM- and USFS-administered grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternative and route variations in Segment 2. Refer also to MV-18.

Table 3-304. Inventory Data for Grazing Allotments in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office and/or National Forest	Number of Allotments Crossed[1,3]	Active Animal Unit Month[1,3]	Total Allotment Acres[1,4]	Acres in the Study Corridor[1,5]
Applicant's Proposed Action	33.8	Baker Field Office	5	121	46,510	6,142
		Wallowa-Whitman	2	4,843	43,317	1,519
Variation S2-A1	*2.8*	*Wallowa-Whitman*	*2*	*4,843*	*43,317*	*1,488*
Variation S2-A2	*2.9*	*Wallowa-Whitman*	*2*	*4,843*	*43,317*	*1,730*
Variation S2-B1	*3.7*	*Baker Field Office*	*1*	*22*	*2,401*	*394*
Variation S2-B2	*3.8*	*Baker Field Office*	*1*	*22*	*2,401*	*131*
Variation S2-C1	*9.3*	*Baker Field Office*	*1*	*34*	*11,097*	*1,042*
Variation S2-C2	*8.8*	*Baker Field Office*	*1*	*34*	*11,097*	*1,246*
Variation S2-E1	*2.3*	*Baker Field Office*	*2*	*46*	*15,654*	*1,091*
Variation S2-E2	*2.6*	*Baker Field Office*	*2*	*46*	*15,654*	*1,170*
Variation S2-F1	*12.1*	*Baker Field Office*	*4*	*99*	*44,109*	*3,094*
Variation S2-F2	*12.2*	*Baker Field Office*	*4*	*99*	*44,109*	*4,137*

Table 3-304. Inventory Data for Grazing Allotments in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office and/or National Forest	Number of Allotments Crossed[1,3]	Active Animal Unit Month[1,3]	Total Allotment Acres[1,4]	Acres in the Study Corridor[1,5]
Glass Hill	33.7	Baker Field Office Wallowa-Whitman	5 2	121 4,843	46,510 43,317	6,647 1,519
Variation S2-D1	*4.3*	*Not applicable*	*0*	*0*	*0*	*0*
Variation S2-D2	*4.1*	*Not applicable*	*0*	*0*	*0*	*0*
Mill Creek	34.0	Baker Field Office Wallowa-Whitman	5 2	121 4843	46,510 43,317	4,988 1,730

Table Notes:
[1]Data source is the U.S. Forest Service and the Bureau of Land Management grazing allotments datasets.
[2]Number of allotments crossed by the B2H Project 1-mile-wide study corridor.
[3]Active animal unit months of allotments crossed by the B2H Project 1-mile-wide study corridor.
[4]Total acres of allotments that are crossed by the B2H Project 1-mile-wide study corridor (including areas of allotments outside of the study corridor).
[5]Acres of allotments present in the B2H Project 1-mile-wide study corridor.

Applicant's Proposed Action Alternative

There are 7 allotments present in the study corridor for the Applicant's Proposed Action in the Baker Field Office and Wallowa-Whitman National Forest.

Variation S2-A1 and S2-A2

These variations have 2 Wallowa-Whitman allotments present in the study corridor.

Variations S2-B1, S2-B2, S2-C1, S2-C2, S2-E1, S2-E2, S2-F1, and S2-F2

These variations have 1 to 4 Baker Field Office allotments present in the study corridor. Variation S2-B2 has the fewest acres of grazing allotments present in the study corridor and Variation S2-F2 has the most acres of grazing allotments present in the study corridor.

Glass Hill Alternative

This alternative route has the same 7 allotments in the 1-mile-wide study corridor as the Applicant's Proposed Action Alternative. Approximately 500 more acres of the Baker Field Office allotments are present within the study corridor.

Variations S2-D1 and S2-D2

The study corridors for these route variations do not have grazing allotments in them.

Mill Creek Alternative

This alternative route has the same 7 allotments in the 1-mile-wide study corridor as the Applicant's Proposed Action Alternative. There are approximately 200 more acres of the Wallowa-Whitman allotments present in the corridor, but approximately 1,100 fewer acres of the Baker Field Office allotments within the study corridor.

SEGMENT 3—BAKER VALLEY

Existing Agriculture

This section describes existing crops, irrigated agriculture, CAFOs, and tree farms present in the study corridor for the Applicant's Proposed Action Alternative and all other alternatives and route variations in Segment 3. Existing agriculture present in Segment 3 includes fallow/idle cropland, field crops, vegetable operations, and grassland/pasture. The climate and soils in the area make it excellent farm ground. There are no orchards of fruit and tree nuts, tree farms, or CAFOS present. There are no critical groundwater areas, but water rights are still obtained by farmers for irrigation. Data are not available to indicate how much land is sprayed with pesticides, but it is anticipated that all cultivated land could be sprayed.

Table 3-305 identifies crops in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 3. Table 3-306 identifies irrigated farmland in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 3. Refer also to MV-16.

Table 3-305. Inventory Data for Crop Types in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Crop Type Crossed (acres)						Confined Animal Feeding Operations (count)[3]
		Fallow/Idle Cropland[1]	Field Crops[1]	Fruit and Tree Nuts[1]	Grass/ Pasture[1]	Vegetables[1]	Tree Farms[2]	
Applicant's Proposed Action	55.2	12	700	0	1,193	6	0	0
Variation S3-A1	*12.4*	*9*	*407*	*0*	*37*	*6*	*0*	*0*
Variation S3-A2	*12.2*	*2*	*239*	*0*	*21*	*2*	*0*	*0*
Variation S3-B1	*13.9*	*0*	*117*	*0*	*90*	*0*	*0*	*0*
Variation S3-B2	*14.4*	*43*	*686*	*0*	*280*	*38*	*0*	*0*
Variation S3-B3	*14.7*	*43*	*709*	*0*	*290*	*38*	*0*	*0*
Variation S3-B4	*14.3*	*48*	*1,084*	*0*	*331*	*43*	*0*	*0*
Variation S3-B5	*14.0*	*50*	*999*	*0*	*325*	*42*	*0*	*0*
Variation S3-C1	*21.1*	*2*	*287*	*0*	*1,024*	*0*	*0*	*0*
Variation S3-C2	*21.7*	*3*	*481*	*0*	*1,180*	*0*	*0*	*0*
Variation S3-C3	*21.1*	*4*	*294*	*0*	*534*	*0*	*0*	*0*
Variation S3-C4	*21.4*	*3*	*194*	*0*	*479*	*0*	*0*	*0*
Variation S3-C5	*21.0*	*2*	*82*	*0*	*456*	*0*	*0*	*0*
Variation S3-C6	*24.7*	*3*	*94*	*0*	*277*	*0*	*0*	*0*
Flagstaff A	55.3	61	1,580	0	1,426	47	0	0
Timber Canyon	70.3	12	1,613	0	603	0	0	0
Flagstaff A – Burnt River Mountain	55.3	63	1,587	0	936	47	0	0
Flagstaff B	56.0	54	1,291	0	1,392	43	0	0

Table 3-305. Inventory Data for Crop Types in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Crop Type Crossed (acres)						Confined Animal Feeding Operations (count)[3]
		Fallow/Idle Cropland[1]	Field Crops[1]	Fruit and Tree Nuts[1]	Grass/ Pasture[1]	Vegetables[1]	Tree Farms[2]	
Flagstaff B – Burnt River West	55.7	47	918	0	808	39	0	0
Flagstaff B – Durkee	59.6	55	1,098	0	645	43	0	0

Table Notes: These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the U.S. Department of Agriculture CropScape
[2]Data source is the Boardman Tree Farm as digitized from aerial imagery
[3]Data source is the Oregon Department of Agriculture confined animal feeding operations and self-reported dairies.

Table 3-306. Inventory Data for Irrigation Types in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Center Pivot Count
Applicant's Proposed Action	55.2	0	381	278	232	5
Variation S3-A1	*12.4*	*0*	*381*	*0*	*12*	*5*
Variation S3-A2	*12.2*	*0*	*216*	*0*	*0*	*4*
Variation S3-B1	*13.9*	*0*	*117*	*0*	*0*	*1*
Variation S3-B2	*14.4*	*0*	*282*	*93*	*569*	*4*
Variation S3-B3	*14.7*	*0*	*305*	*95*	*588*	*5*
Variation S3-B4	*14.3*	*0*	*441*	*148*	*838*	*7*
Variation S3-B5	*14.0*	*0*	*371*	*152*	*797*	*5*
Variation S3-C1	*21.1*	*0*	*0*	*278*	*220*	*0*
Variation S3-C2	*21.7*	*0*	*0*	*401*	*319*	*0*
Variation S3-C3	*21.1*	*0*	*0*	*382*	*46*	*0*
Variation S3-C4	*21.4*	*0*	*0*	*273*	*46*	*0*
Variation S3-C5	*21.0*	*0*	*0*	*165*	*0*	*0*
Variation S3-C6	*24.7*	*0*	*0*	*175*	*0*	*0*
Flagstaff A	55.3	0	636	430	1029	9
Timber Canyon	70.3	0	53	1411	257	1
Flagstaff A – Burnt River Mountain	55.3	0	636	534	855	9
Flagstaff B	56.0	0	569	373	820	9

Table 3-306. Inventory Data for Irrigation Types in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Center Pivot Count
Flagstaff B – Burnt River West	55.7	0	404	260	588	8
Flagstaff B – Durkee	59.6	0	569	270	600	9

Table Note: Data source for this table includes cultivated farmland classified as dryland or as an irrigation type digitized from aerial imagery within the B2H Project 1-mile-wide study corridor for each alternative and variation. Center pivot count includes partial or full pivots within the 1-mile-wide study corridor for each alternative and variation.

Applicant's Proposed Action Alternative

The most common crop types present in the study corridor for the Applicant's Proposed Action Alternative are field crops and grasslands/pasture. There also are vegetable farming operations and fallow/idle cropland. There are no orchards of fruit and tree nuts or tree farms. No CAFOs are operating in the study corridor. Most irrigated farmland in the study corridor is irrigated by center pivot irrigation. There are 5 center pivots in the study corridor. Some irrigated farmland is irrigated with flood or other mechanized irrigation. There is no dryland farmland in the study corridor.

Variations S3-A1 and S3-A2

Both of these route variations have fallow/idle cropland, field crops, grasslands/pasture, and vegetable farming operations in the 1-mile-wide study corridor. Variation S3-A1 has more acres of these crops than Variation S3-A2 present in the study corridor. Variation S3-A1 has pivot irrigation and other mechanized irrigation, while Variation S3-A2 has fewer acres of pivot irrigation and no other mechanized irrigation present in the study corridor.

Variations S3-B1 through S3-B5

These variations have fallow/idle cropland, field crops, grasslands/pasture, and vegetable farming operations in the study corridor. Variation S3-B1 has the fewest acres of these crops present in the study corridor and Variation S3-B4 has the most acres of these crops present in the study corridor. Most irrigated farmland in the study corridor is irrigated by other mechanized irrigation. There is some pivot and flood irrigation present in the study corridor. Variation S3-B1 has the fewest acres of irrigated farmland present in the study corridor and Variation S3-B4 has the most acres of irrigated farmland present in the study corridor.

Variations S3-C1 through S3-C6

All of these route variations have fallow/idle cropland, field crops, and grasslands/pasture present in the study corridor. Variation S3-C2 has the most acres of these crops present in the study corridor, and Variation S3-C6 has the least acres of these crops present in the study corridor. These route variations have flood and other mechanized irrigation present in the study corridor. Variation S3-C2 has the most irrigated farmland present in the study corridor, and Variation S3-C5 has the least acres of irrigated farmland present in the study corridor.

Flagstaff A Alternative

Compared to the Applicant's Proposed Action Alternative, the Flagstaff A Alternative has more acres of the same types of crops present in the study corridor. This alternative route also has more than twice the irrigated farmland as the Applicant's Proposed Action Alternative, and has nine pivots in the study corridor.

Timber Canyon Alternative

This Timber Canyon Alternative has approximately twice the field crops and half the grasslands/pasture present in the study corridor as the Applicant's Proposed Action Alternative. It has more than twice the irrigated agriculture as the Applicant's Proposed Action Alternative present in the study corridor.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A – Burnt River Mountain Alternative has more acres of field crops, vegetable farming operations, and fallow/idle cropland, but fewer acres of grassland pasture than the Applicant's Proposed Action Alternative. It has more than twice the acres of irrigated farmland within the study corridor as the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

The Flagstaff B Alternative has more acres of field crops, vegetable farming operations, grasslands/pasture and fallow/idle cropland than the Applicant's Proposed Action Alternative. It has more than twice the acres of irrigated farmland within the study corridor as the Applicant's Proposed Action Alternative. This alternative has the most other mechanized irrigation within the study corridor of any alternative in Segment 3.

Flagstaff B – Burnt River West Alternative

The Flagstaff B – Burnt River West Alternative has more acres present in the study corridor of field crops, vegetable farming operations, and fallow/idle cropland, but fewer acres of grassland pasture than the Applicant's Proposed Action Alternative. It has 361 more acres of irrigated farmland within the study corridor than the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

The Flagstaff B – Durkee Alternative has more acres present in the study corridor of field crops, vegetable farming operations, and fallow/idle cropland, but fewer acres of grassland pasture than the Applicant's Proposed Action Alternative. It has 548 more acres of irrigated farmland within the study corridor as the Applicant's Proposed Action Alternative.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

This section examines important farmland, high-value soils, and CRP lands in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 3. Segment 3 contains prime farmland if irrigated, farmland of statewide importance, and high-value soils. No prime farmland or unique farmland is present in this study corridor for the alternatives and route variations in Segment 3. Table 3-307 identifies the important farmland and high-value soils in the study

corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 3. Table 3-308 identifies the CRP lands present in each county in Segment 3. Refer also to MV-17.

Table 3-307. Inventory Data for Important Farmland and High-Value Soils in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Important Farmland (acres)		High-Value Soils[3] (acres)
		Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	
Applicant's Proposed Action	55.2	2,682	22,039	2,682
Variation S3-A1	*12.4*	*305*	*3,981*	*305*
Variation S3-A2	*12.2*	*111*	*3,923*	*111*
Variation S3-B1	*13.9*	*1,217*	*5,652*	*1,217*
Variation S3-B2	*14.4*	*1,200*	*5,681*	*1,200*
Variation S3-B3	*14.7*	*1,278*	*5,824*	*1,278*
Variation S3-B4	*14.3*	*1,705*	*5,273*	*1,705*
Variation S3-B5	*14.0*	*1,499*	*5,235*	*1,499*
Variation S3-C1	*21.1*	*1,160*	*9,422*	*1,160*
Variation S3-C2	*21.7*	*1,446*	*9,383*	*1,446*
Variation S3-C3	*21.1*	*1,092*	*7,551*	*1,092*
Variation S3-C4	*21.4*	*984*	*7,745*	*984*
Variation S3-C5	*21.0*	*411*	*7,375*	*411*
Variation S3-C6	*24.7*	*566*	*10,902*	*566*
Flagstaff A	55.3	2,964	21,617	2,964
Timber Canyon	70.3	1,603	19,121	1,913
Flagstaff A – Burnt River Mountain	55.3	2,896	19,746	2,896
Flagstaff B	55.9	2,743	22,207	2,743
Flagstaff B – Burnt River West	55.7	1,799	20,103	1,799
Flagstaff B – Durkee	59.6	2,149	23,686	2,149

Table Notes: These are for resource inventory within the B2H Project 1-mile-wide study corridor.

[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data.

[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained.

[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Also, lands enrolled in the USDA CRP are present in Segment 3. CRP data were not available in a format to allow an inventory for each alternative and route variation in Segment 3. Rather, data were available by county (refer to Table 3-308). In 2014, there were several thousand acres of CRP lands in counties crossed by alternative routes and variations in Segment 3.

Table 3-308. County Conservation Reserve Program Acres Enrolled 2010-2014 in Segment 3—Baker Valley					
County	**2010**	**2011**	**2012**	**2013**	**2014**
Union	9,784	9,609	9,108	9,222	8,992
Baker	5,223	5,280	5,378	5,385	5,327
Table Note: Data is sourced from the U.S. Department of Agriculture Farm Service Agency Conservation Program index at http://www.fsa.usda.gov/programs-and-services/conservation-programs/reports-and-statistics/conservation-reserve-program-statistics/index.					

Applicant's Proposed Action Alternative

Farmlands present in the study corridor include prime farmland if irrigated, and farmland of statewide importance, in addition to high-value soils.

Variations S3-A1 and S3-A2

Variation S3-A1 has more prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor than Variation S3-A2.

Variations S3-B1 through S3-B5

All of the route variations have prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor. Variation S3-B4 has the most prime farmland if irrigated and high-value soils; Variation S3-B3 has the most farmland of statewide importance present in the study corridor.

Variations S3-C1 through Variation S3-C6

Variation S3-C2 has the most prime farmland if irrigated and high-value soils present in the study corridor; Variation S3-C6 has the most farmland of statewide importance present in the study corridor.

Flagstaff A Alternative

The Flagstaff A Alternative has more prime farmland if irrigated and high-value soils than the Applicant's Proposed Action Alternative, but fewer acres of farmland of statewide importance are present in the study corridor.

Timber Canyon Alternative

This alternative has fewer acres of prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor than the Applicant's Proposed Action.

Flagstaff A – Burnt River Mountain Alternative

The Flagstaff A Burnt River Mountain Alternative has more prime farmland if irrigated and high-value soils than the Applicant's Proposed Action Alternative, but fewer acres of farmland of statewide importance are present in the study corridor.

Flagstaff B Alternative

This alternative has more prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor than the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

This alternative has less prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor than the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

This alternative has less prime farmland if irrigated and high-value soils, but more farmland of statewide importance than the Applicant's Proposed Action Alternative.

Livestock Grazing

This section examines grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 3. Grazing allotments relevant to Segment 3 include Balm Creek, Big Creek, Frazier Mountain, Goose Creek, Hootin Rock, and Trouble Gulch (managed by the USFS); Alder Creek, Baldy Mountain, Barnard Creek, Cave Creek, Clough Gulch, Crews Creek, Deer Gulch, Dixie Creek, Dogtown Creek, Dry Creek, Dry Gulch, Durkee, East Pleasant Valley, Encina, Farley Hills, Fisk Reservoir, Flagstaff, French Creek, Fur Mountain, Gold Creek, Hollowfield Canyon, Horseshoe, Iron Mountain, Jordan Creek, Keating Highway, Lone Pine Mountain, Lookout Mountain, Lost Basin, Lower Manning Creek, Magpie Peak, North Dixie Creek, North Flagstaff, North Swayze Creek, Oregon Trail, Pearce Gulch, Pedro Mountain, Pipeline, Pleasant Valley, Powell Creek, Pritchard Creek, Quartz Creek, Ranch Creek, Rattlesnake Gulch, Rattlesnake Hill, Riverdale Hill, Ruckles Creek, Rye Valley, Sheep Mountain, Shirttail Creek, Sisley Creek, South Flagstaff, Squaw Creek, Storie Gulch, Summit Pasture, Summit Spring, Sunnyslope, Thief Valley, Timber Canyon, Titus, True Blue Gulch, Tunnel, Turner Gulch, Unallotted (multiple), Unity Creek, Upper Crews Creek, Upper Dry Gulch, Upper Shirttail Creek, Vandecar, Virtue Hills, Weatherby Mountain, Weatherby Station, West Crews, West Magpie Peak, and Woods Gulch (managed by the BLM). Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Note that while this discussion is identifying all allotments within a half mile of the alternative routes and variations, Appendix G identifies only those allotments actually crossed by the alternative routes and variations, which is why allotments may be included here, but not listed in the appendix as being affected by the B2H Project.

Table 3-309 identifies the acres and AUMs of BLM- and USFS-administered grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternative and route variations in Segment 3. Refer also to MV-18.

Table 3-309. Inventory Data for Grazing Allotments in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office and/or National Forest	Number of Allotments Crossed[1,2]	Active Animal Unit Month[1,3]	Total Allotment Acres[1,4]	Acres in the Study Corridor[1,5]
Applicant's Proposed Action	55.2	Baker Field Office	44	12,707	132,496	22,065
Variation S3-A1	*12.4*	*Baker Field Office*	*5*	*647*	*18,228*	*2,817*
Variation S3-A2	*12.2*	*Baker Field Office*	*5*	*533*	*19,540*	*3,202*

Table 3-309. Inventory Data for Grazing Allotments in Segment 3—Baker Valley						
Alternative Route	**Total Length (miles)**	**Bureau of Land Management Field Office and/or National Forest**	**Number of Allotments Crossed[1,2]**	**Active Animal Unit Month[1,3]**	**Total Allotment Acres[1,4]**	**Acres in the Study Corridor[1,5]**
Variation S3-B1	*13.9*	*Baker Field Office*	*14*	*3,180*	*37,901*	*7,581*
Variation S3-B2	*14.4*	*Baker Field Office*	*9*	*710*	*16,300*	*5,086*
Variation S3-B3	*14.7*	*Baker Field Office*	*9*	*710*	*16,300*	*4,953*
Variation S3-B4	*14.3*	*Baker Field Office*	*9*	*710*	*16,300*	*4,200*
Variation S3-B5	*14.0*	*Baker Field Office*	*9*	*710*	*16,300*	*4,419*
Variation S3-C1	*21.1*	*Baker Field Office*	*20*	*4,192*	*73,957*	*9,325*
Variation S3-C2	*21.7*	*Baker Field Office*	*21*	*5,223*	*84,186*	*9,017*
Variation S3-C3	*21.1*	*Baker Field Office*	*19*	*5,438*	*63,154*	*8,405*
Variation S3-C4	*21.4*	*Baker Field Office*	*19*	*5,438*	*63,154*	*8,796*
Variation S3-C5	*21.0*	*Baker Field Office*	*19*	*5,475*	*60,604*	*11,718*
Variation S3-C6	*24.7*	*Baker Field Office*	*21*	*7,035*	*79,663*	*13,194*
Flagstaff A	55.3	Baker Field Office	40	10,867	118,927	18,902
Timber Canyon	70.3	Baker Field Office Wallowa-Whitman	22 6	2,544 6,562	87,785 86,062	19,278 13,132
Flagstaff A – Burnt River Mountain	55.3	Baker Field Office	39	11,933	108,124	17,983
Flagstaff B	56.0	Baker Field Office	40	10,687	118,927	19,436
Flagstaff B – Burnt River West	55.7	Baker Field Office	39	11,856	106,885	22,215
Flagstaff B – Durkee	59.6	Baker Field Office	41	13,530	124,633	23,306

Table Notes:
[1]Data source is the U.S. Forest Service and the Bureau of Land Management grazing allotments datasets.
[2]Number of allotments crossed by the B2H Project 1-mile-wide study corridor.
[3]Active animal unit months of allotments crossed by the B2H Project 1-mile-wide study corridor.
[4]Total acres of allotments that are crossed by the B2H Project 1-mile-wide study corridor (including areas of allotments outside of the study corridor).
[5]Acres of allotments present in the B2H Project 1-mile-wide study corridor.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative has the most acres of allotments and AUMs within the study corridor, second to Flagstaff B – Durkee. This alternative route has the most allotments present in the study corridor.

Variations S3-A1 and S3-A2

Variation S3-A2 has 385 more allotment acres present in the study corridor than S3-A1. They both have the same number of allotments (though not the exact same allotments) present in the 1-mile-wide study corridor.

Variations S3-B1 through S3-B5

Variation S3-B1 has more allotments in the 1-mile-wide study corridor than any other variation. Variation S3-B4 has the fewest allotment acres present in the study corridor, and Variation S3-B1 has

the most allotment acres present in the study corridor (approximately 2,500 more acres than any other route variation).

Variations S3-C1 through S3-C6

Variations S3-C2 and S3-C6 have the most allotments present in their study corridor. Variation S3-C6 has the most allotment acres present in the study corridor. Variation S3-C3 has the fewest allotment acres present in the study corridor.

Flagstaff A Alternative

Compared to the Applicant's Proposed Action Alternative, the Flagstaff A Alternative has 4 fewer allotments in the study corridor and 3,163 fewer allotment acres.

Timber Canyon Alternative

Compared to the Applicant's Proposed Action Alternative, the Timber Canyon Alternative has 16 fewer allotments in the study corridor, but has 10,345 more allotment acres present in the study corridor.

Flagstaff A – Burnt River Mountain Alternative

Compared to the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative has 5 fewer allotments in the study corridor and 4,082 fewer allotment acres.

Flagstaff B Alternative

Compared to the Applicant's Proposed Action Alternative, the Flagstaff B Alternative has 4 fewer allotments in the study corridor and 2,629 fewer allotment acres.

Flagstaff B – Burnt River West Alternative

Compared to the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative has 5 fewer allotments in the study corridor, but similar allotment acres within the study corridor.

Flagstaff B – Durkee

Compared to the Applicant's Proposed Action Alternative, the Flagstaff B- Durkee Alternative has 3 fewer allotments in the study corridor, but has 1,241 more allotment acres present in the study corridor.

SEGMENT 4—BROGAN

Existing Agriculture

This section describes existing crops, irrigated agriculture, CAFOs, and tree farms present in the study corridor for the Applicant's Proposed Action Alternative and all other alternatives and route variations in Segment 3. Existing agriculture present in Segment 3 includes fallow/idle cropland, field crops, vegetable operations, and grassland/pasture. There are no orchards of fruit and tree nuts, tree farms, or CAFOS present. There are no critical groundwater areas, but water rights are still obtained by farmers for irrigation. Data are not available to indicate how much land is sprayed with pesticides, but it is anticipated that all cultivated land could be sprayed.

Table 3-310 identifies crops in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 4. Table 3-311 identifies irrigated farmland in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 4. Refer also to MV-16.

Table 3-310. Inventory Data for Crop Types in Segment 4—Brogan

Alternative Route	Total Length (miles)	Crop Type Crossed (acres)						Confined Animal Feeding Operations (count)[3]
		Fallow/Idle Cropland[1]	Field Crops[1]	Fruit and Tree Nuts[1]	Grass/ Pasture[1]	Vegetables[1]	Tree Farms[2]	
Applicant's Proposed Action	40.1	25	28	0	2,941	6	0	0
Variation S4-A1	*5.9*	*3*	*19*	*0*	*702*	*0*	*0*	*0*
Variation S4-A2	*6.0*	*4*	*22*	*0*	*707*	*0*	*0*	*0*
Variation S4-A3	*6.1*	*2*	*20*	*0*	*719*	*0*	*0*	*0*
Tub Mountain South	40.5	292	1,493	0	12,973	94	0	0
Willow Creek	34.6	48	1,215	0	6,626	87	0	0

Table Notes:
These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the U.S. Department of Agriculture CropScape
[2]Data source is the Boardman Tree Farm as digitized from aerial imagery
[3]Data source is the Oregon Department of Agriculture confined animal feeding operations and self-reported dairies.

Table 3-311. Inventory Data for Irrigation Types in Segment 4—Brogan

Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Center Pivot Count
Applicant's Proposed Action	40.1	0	0	29	12	0
Variation S4-A1	*5.9*	*0*	*0*	*29*	*0*	*0*
Variation S4-A2	*6.0*	*0*	*0*	*33*	*0*	*0*
Variation S4-A3	*6.1*	*0*	*0*	*20*	*0*	*0*
Tub Mountain South	40.5	24	727	832	83	13
Willow Creek	34.6	12	820	165	158	15

Table Note: Data source for this table includes cultivated farmland classified as dryland or as an irrigation type digitized from aerial imagery within the B2H Project 1-mile-wide study corridor for each alternative and variation. Center pivot count includes partial or full pivots within the 1-mile-wide study corridor for each alternative and variation.

Applicant's Proposed Action Alternative

The most common crop types present in the study corridor for the Applicant's Proposed Action Alternative are field crops and grasslands/pasture. There also are vegetable farming operations and fallow/idle cropland. There are no orchards of fruit and tree nuts or tree farms. No CAFOs are operating in the study corridor. Most irrigated farmland in the study corridor is irrigated by flood irrigation. Some irrigated farmland is irrigated with other mechanized irrigation. There is no dryland or center pivot-

irrigated farmland in the study corridor. This alternative route has the least crops and irrigated farmland present in the study corridor of all alternative routes in Segment 4.

Variations S4-A1 through S4-A3

These route variations all have fallow/idle cropland, field crops, and grasslands/pasture present in the study corridor. Variation S4-A2 has the most fallow/idle cropland and field crops present in the study corridor; Variation S4-A3 has the most grasslands/pasture present in the study corridor. These variations have only flood irrigation present in the study corridor, and Variation S4-A2 has the most flood irrigation present in the study corridor.

Tub Mountain South Alternative

The Tub Mountain South Alternative has more fallow/idle cropland, field crops, grasslands/pasture, and vegetable operations present in the study corridor than any alternative in Segment 4, including the Applicant's Proposed Action Alternative. This alternative route has the most flood-irrigated and dryland farmland present in the study corridor.

Willow Creek Alternative

The Willow Creek Alternative has more fallow/idle cropland, field crops, grasslands/pasture, and vegetable operations present in the study corridor than the Applicant's Proposed Action alternative. This alternative route has the most pivot-irrigated farmland of all alternatives in Segment 4 (15 pivots) and other mechanized irrigation present in the study corridor.

Comments on the Draft EIS indicated that the Willow Creek Alternative crossed the existing Gum Creek Airstrip used to spray farmland throughout the area. In addition, comments on the Draft EIS indicated that an artesian well is present in the Willow Creek Alternative and that this is the most productive agricultural land in the area.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

This section examines important farmland, high-value soils, and CRP lands in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 4. Segment 4 contains prime farmland if irrigated, farmland of statewide importance, and high-value soils. No prime farmland or unique farmland is present in this study corridor for the alternatives and route variations in Segment 4. Table 3-312 identifies the important farmland and high-value soils in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 4. Refer also to MV-17.

Table 3-312. Inventory Data for Important Farmland and High-Value Soils in Segment 4—Brogan				
Alternative Route	Total Length (miles)	Important Farmland (acres)		High-Value Soils[3] (acres)
		Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	
Applicant's Proposed Action	40.1	181	4,958	181
Variation S4-A1	*5.9*	*181*	*3,146*	*181*
Variation S4-A2	*6.0*	*284*	*2,943*	*284*
Variation S4-A3	*6.1*	*181*	*2,973*	*181*
Tub Mountain South	40.5	1,398	6,152	1,720
Willow Creek	34.6	783	4,502	825

Table Notes*:* These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data.
[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained.
[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Also, lands enrolled in the USDA CRP are present in Segment 4. CRP data were not available in a format to allow an inventory for each alternative and route variation in Segment 4. Rather, data were available by county (refer to Table 3-313). In 2014, there were several thousand acres of CRP lands in counties crossed by alternative routes and segments in Segment 4. However, no CRP lands are crossed by the Applicant's Proposed Action or any of the alternative routes or variations in Segment 4.

Table 3-313. County Conservation Reserve Program Acres Enrolled 2010-2014 in Segment 4—Brogan					
County	2010	2011	2012	2013	2014
Baker	5,223	5,280	5,378	5,385	5,327
Malheur	341	358	358	358	318

Table Note: Data is sourced from the U.S. Department of Agriculture Farm Service Agency Conservation Program index at http://www.fsa.usda.gov/programs-and-services/conservation-programs/reports-and-statistics/conservation-reserve-program-statistics/index.

Applicant's Proposed Action Alternative

Farmlands present in the study corridor include prime farmland if irrigated, and farmland of statewide importance, in addition to high-value soils. The Applicant's Proposed Action Alternative has the least prime farmland if irrigated and high-value soils present in the study corridor.

Variations S4-A1 through S4-A3

Variation S4-A1 has the most farmland of statewide importance present in the study corridor, but Variation S4-A2 has the most prime farmland if irrigated and high-value soils present in the study corridor.

Tub Mountain South Alternative

This alternative has the most prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor of all alternatives in Segment 4.

Willow Creek Alternative

The Willow Creek Alternative has the least farmland of statewide importance present in the study corridor. It has more prime farmland if irrigated and high-value soils present in the study corridor than the Applicant's Proposed Action Alternative.

Livestock Grazing

This section examines grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 4. Grazing allotments relevant to Segment 4 include Alkali Spring, Becker Creek, Benson Creek, Boswell Spring, Brogan Canyon, Bully Creek, Bully Reservoir, Canyon Creek, Cavanaugh Creek, Cottonwood Mountain, Cow Valley, East Table Mountain, Farewell Bend, Freeway, Huntington, Jamieson, Lime Plant, Little Valley, Phipps Creek (E), Phipps Creek (N), Phipps Creek West, Poall Creek, Powell Creek, Sheep Corral Creek, South Alkali, Storie Gulch, Thorn Flat, Unallotted (multiple), West Highway, and Willow Creek Livestock (managed by the BLM). Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Note that while this discussion is identifying all allotments within a half mile of the alternative routes and variations, Appendix G identifies only those allotments actually crossed by the alternative routes and variations, which is why allotments may be included here, but not listed in the appendix as being affected by the B2H Project.

Table 3-314 identifies the BLM-administered grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternative and route variations in Segment 4. Refer also to MV-18.

Table 3-314. Inventory Data for Grazing Allotments in Segment 4—Brogan

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office	Number of Allotments Crossed[1,3]	Active Animal Unit Month[1,3]	Total Allotment Acres[1,4]	Acres in the Study Corridor[1,5]
Applicant's Proposed Action	40.1	Baker Field Office	6	1,243	52,875	7,767
		Malheur Field Office	12	11,570	136,776	15,344
Variation S4-A1	*5.9*	*Baker Field Office*	*5*	*548*	*32,236*	*3,465*
Variation S4-A2	*6.0*	*Baker Field Office*	*7*	*2,567*	*46,825*	*3,309*
Variation S4-A3	*6.1*	*Baker Field Office*	*6*	*2528*	*43,103*	*3,363*
Tub Mountain South	40.5	Baker Field Office	11	3,739	54,766	5,874
		Malheur Field Office	6	21,521	123,213	13,661
Willow Creek	34.6	Baker Field Office	8	2,223	57,853	6,849
		Malheur Field Office	6	14,315	86,227	8,667

Table Notes:

[1]Data source is the U.S. Forest Service and the Bureau of Land Management grazing allotments datasets.

[2]Number of allotments crossed by the B2H Project 1-mile-wide study corridor.

[3]Active animal unit months of allotments crossed by the B2H Project 1-mile-wide study corridor.

[4]Total acres of allotments that are crossed by the B2H Project 1-mile-wide study corridor (including areas of allotments outside of the study corridor).

[5]Acres of allotments present in the B2H Project 1-mile-wide study corridor.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action has 18 allotments and 23,111 allotment acres present in the study corridor.

Variations S4-A1 through S4-A3

Of these route variations, Variation S4-A2 has the most allotments and Variation S4-A1 has the fewest allotments present in the study corridor. However, Variation S4-A2 has the fewest allotment acres and Variation S4-A1 has the most allotment acres in the study corridor.

Tub Mountain South Alternative

Compared to the Applicant's Proposed Action Alternative, the Tub Mountain South Alternative has 1 fewer allotment and 3,576 fewer allotment acres present in the study corridor.

Willow Creek Alternative

Compared to the Applicant's Proposed Action Alternative, the Willow Creek Alternative has 4 fewer allotments present in the study corridor and 7,595 fewer allotment acres present in the study corridor.

SEGMENT 5—MALHEUR

Existing Agriculture

This section describes existing crops, irrigated agriculture, CAFOs, and tree farms present in the study corridor for the Applicant's Proposed Action Alternative and all other alternatives and route variations in Segment 5. Existing agriculture present in Segment 5 includes fallow/Idle cropland, field crops, vegetable operations, orchards of fruit and tree nuts, and grassland/pasture. There are no tree farms, or CAFOS present. There is one critical groundwater area in Malheur County, the Cow Valley critical groundwater area, and groundwater in this area is at historic lows (Ward 2010). The Applicant's Proposed Action and none of the other alternative routes and variation study corridors cross this critical groundwater area. Data are not available to indicate how much land is sprayed with pesticides, but it is anticipated that all cultivated land could be sprayed.

Comments on the Draft EIS indicated that there is irrigation infrastructure managed by the Owyhee Irrigation District present in the study corridor for Segment 5. The BLM has obtained the Owyhee Irrigation District's GIS data showing the locations of siphons, pipelines, laterals, and canals used to transport water from the Owyhee River to agricultural operations in Malheur County. All alternatives and variations in this Segment have these Owyhee Irrigation District facilities present in the study corridor.

Table 3-315 identifies crops in the study corridor and Table 3-316 identifies irrigated farmland in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 5. Refer also to MV-16.

Table 3-315. Inventory Data for Crop Types in Segment 5—Malheur

Alternative Route	Total Length (miles)	Crop Type Crossed (acres)						Confined Animal Feeding Operations (count)[3]
		Fallow/Idle Cropland[1]	Field Crops[1]	Fruit and Tree Nuts[1]	Grass/ Pasture[1]	Vegetables[1]	Tree Farms[2]	
Applicant's Proposed Action	40.4	155	308	0	13,685	5	0	0
Variation S5-A1	*7.4*	*52*	*85*	*0*	*3,863*	*1*	*0*	*0*
Variation S5-A2	*7.4*	*1*	*7*	*0*	*3,939*	*0*	*0*	*0*
Variation S5-B1	*2.5*	*33*	*157*	*0*	*552*	*2*	*0*	*0*
Variation S5-B2	*2.8*	*74*	*443*	*1*	*577*	*13*	*0*	*0*
Malheur S	43.5	54	37	0	10,092	2	0	0
Malheur A	43.1	47	37	0	9,677	1	0	0

Table Notes:
These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the U.S. Department of Agriculture CropScape
[2]Data source is the Boardman Tree Farm as digitized from aerial imagery
[3]Data source is the Oregon Department of Agriculture confined animal feeding operations and self-reported dairies.

Table 3-316. Inventory Data for Irrigation Types in Segment 5—Malheur

Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Center Pivot Count
Applicant's Proposed Action	40.4	52	100	43	28	2
Variation S5-A1	*7.4*	*36*	*73*	*0*	*0*	*1*
Variation S5-A2	*7.4*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*2.5*	*0*	*25*	*26*	*0*	*1*
Variation S5-B2	*2.8*	*0*	*54*	*113*	*0*	*1*
Malheur S	43.5	0	0	17	0	0
Malheur A	43.1	0	0	17	0	0

Table Notes: Data source for this table includes cultivated farmland classified as dryland or as an irrigation type digitized from aerial imagery within the B2H Project 1-mile-wide study corridor for each alternative and variation. Center pivot count includes partial or full pivots within the 1-mile-wide study corridor for each alternative and variation.

Applicant's Proposed Action Alternative

The most common crop types present in the study corridor for the Applicant's Proposed Action Alternative are field crops and grasslands/pasture. There also are vegetable farming operations, orchards of fruit tree and nuts, and fallow/idle cropland. There are no tree farms or CAFOs operating in the study corridor. Most irrigated farmland in the study corridor is irrigated by center pivot irrigation. Some irrigated farmland is irrigated with flood or other mechanized irrigation. There is some dryland present in the study corridor. The Applicant's Proposed Action Alternative has the most crops and irrigated farmland present in the study corridor of all alternative routes in Segment 5.

This alternative route has Owyhee Irrigation District infrastructure present in the corridor, including one canal and one lateral (the Kingman Lateral) present in the study corridor.

Variations S5-A1 and S5-A2

Variation S5-A1 has more field crops, fallow/idle farmland, and vegetables present in the study corridor than Variation S5-A2. Variation S5-A2 has more grasslands/pasture in the study corridor than Variation S5-A1. Variation S5-A2 has no irrigated farmland present in the study corridor, while variation S5-A1 has center pivot irrigation. These route variations do not have Owyhee Irrigation District infrastructure present in the study corridor. These variations have an Owyhee Irrigation District canal, three siphons, and two laterals present in the study corridor.

Variations S5-B1 and S5-B2

Variation S5-B2 has more fallow/idle cropland, field crops, orchards of fruit and tree nuts, vegetables, and orchards of fruit and tree nuts than Variation S5-B2. Variation S5-B2 has more center pivot- and flood-irrigated farmland than Variation S5-B2.

Malheur S Alternative

The Malheur S Alternative has less fallow/idle cropland, field crops, grassland/pasture, and vegetables than the Applicant's Proposed Action Alternative. Irrigated farmland present in this study corridor is the least of all alternative routes in Segment 5. This alternative route has one Owyhee Irrigation District siphon present in the study corridor.

Malheur A Alternative

The Malheur A Alternative has the least fallow/idle cropland, field crops, grasslands/pasture, and vegetables present in the study corridor of all alternatives in Segment 5. Irrigated farmland in this study corridor is the same as the Malheur S Alternative. This alternative route has one Owyhee Irrigation District siphon present in the study corridor.

Important Farmland, High-value Soils, and Conservation Reserve Program Lands

This section examines important farmland, high-value soils, and CRP lands in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 5. Segment 5 contains prime farmland if irrigated, farmland of statewide importance, and high-value soils. No prime farmland or unique farmland is present in this study corridor for the alternatives and route variations in Segment 5. Table 3-317 identifies the important farmland and high-value soils in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 5. Refer also to MV-17.

Table 3-317. Inventory Data for Important Farmland and High-Value Soils in Segment 5—Malheur

Alternative Route	Total Length (miles)	Important Farmland (acres)		High-Value Soils[3] (acres)
		Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	
Applicant's Proposed Action	40.4	26	299	4,287
Variation S5-A1	*7.4*	*0*	*0*	*991*
Variation S5-A2	*7.4*	*0*	*0*	*1,149*
Variation S5-B1	*2.5*	*26*	*264*	*375*
Variation S5-B2	*2.8*	*304*	*362*	*747*
Malheur S	43.5	0	<1	1,902
Malheur A	43.1	0	<1	1,843

Table Notes*:* These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data.
[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained.
[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Also, lands enrolled in the USDA CRP are present in Segment 5. CRP data were not available in a format to allow an inventory for each alternative and route variation in Segment 5. Rather, data were available by county (refer to Table 3-318). In 2014, there were 318 acres of CRP lands in counties crossed by alternative routes and segments in Segment 5. However, no CRP lands are crossed by the Applicant's Proposed Action or any of the alternative routes or variations in Segment 5.

Table 3-318. County Conservation Reserve Program Acres Enrolled 2010-2014 in Segment 5—Malheur

County	2010	2011	2012	2013	2014
Malheur	341	358	358	358	318

Table Note: Data is sourced from the U.S. Department of Agriculture Farm Service Agency Conservation Program index at http://www.fsa.usda.gov/programs-and-services/conservation-programs/reports-and-statistics/conservation-reserve-program-statistics/index.

Applicant's Proposed Action Alternative

Farmlands present in the study corridor include prime farmland if irrigated, farmland of statewide importance, in addition to high-value soils. The Applicant's Proposed Action Alternative has the most prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor in Segment 5.

Variations S5-A1 and S5-A2

These route variations are similar; neither has prime farmland if irrigated or farmland of statewide importance present in the study corridor, but Variation S5-A2 has more high-value soils present in the study corridor.

Variations S5-B1 and S5-B2

Variation S5-B2 has more prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor than Variation S5-B1.

Malheur S Alternative

The Malheur S Alternative has less prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the study corridor than the Applicant's Proposed Action Alternative.

Malheur A Alternative

The Malheur A Alternative is similar to the Malheur S Alternative.

Livestock Grazing

This section examines grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 5. Grazing allotments relevant to Segment 5 include Black Jack, Board Corrals, Bully Creek, Cottonwood Mountain, Dry Creek, Little Valley, Lower Owyhee, Mitchell Butte, Nyssa, Radar Hill, Sourdough, Tunnel Canyon, and West Bench (managed by the BLM). Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Note that while this discussion is identifying all allotments within a half mile of the alternative routes and variations, Appendix G identifies only those allotments actually crossed by the alternative routes and variations, which is why allotments may be included here, but not listed in the appendix as being affected by the B2H Project.

Table 3-319 identifies the BLM- and USFS-administered grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternative and route variations in Segment 5. Refer also to MV-18.

Table 3-319. Inventory Data for Grazing Allotments in Segment 5—Malheur

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office	Number of Allotments Crossed[1,3]	Active Animal Unit Month[1,3]	Total Allotment Acres[1,4]	Acres in the Study Corridor[1,5]
Applicant's Proposed Action	40.4	Malheur Field Office	11	32,713	331,053	24,430
Variation S5-A1	*7.4*	*Malheur Field Office*	*3*	*12,205*	*120,336*	*4,917*
Variation S5-A2	*7.4*	*Malheur Field Office*	*3*	*12,205*	*120,336*	*5,229*
Variation S5-B1	*2.5*	*Malheur Field Office*	*3*	*7,084*	*96,887*	*1,576*
Variation S5-B2	*2.8*	*Malheur Field Office*	*3*	*7,084*	*96,887*	*1,144*
Malheur S	43.5	Malheur Field Office	10	28,163	305,927	27,438
Malheur A	43.1	Malheur Field Office	10	28,163	305,927	27,029

Table Notes:
[1]Data source is the U.S. Forest Service and the Bureau of Land Management grazing allotments datasets.
[2]Number of allotments crossed by the B2H Project 1-mile-wide study corridor.
[3]Active animal unit months of allotments crossed by the B2H Project 1-mile-wide study corridor.
[4]Total acres of allotments that are crossed by the B2H Project 1-mile-wide study corridor (including areas of allotments outside of the study corridor).
[5]Acres of allotments present in the B2H Project 1-mile-wide study corridor.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action has 11 allotments and 24,430 acres present in the study corridor. These allotments are permitted for 32,713 AUMs.

Variations S5-A1 and S5-A2

These route variations have the same 3 allotments present in the study corridor, but Variation S5-A2 has 312 more allotment acres present in the study corridor.

Variations S5-B1 and S5-B2

These route variations have the same 3 allotments present in the study corridor, but Variation S5-B1 has 432 more allotment acres present in the study corridor.

Malheur S Alternative

Compared to the Applicant's Proposed Action Alternative, the Malheur S Alternative has 1 less allotment present in the study corridor. However, this alternative route has 3,008 more allotment acres present in the study corridor.

Malheur A Alternative

The Malheur A Alternative is similar to the Malheur S Alternative, except that there are fewer acres of allotments in the study corridor.

SEGMENT 6—TREASURE VALLEY

Existing Agriculture

This section describes existing crops, irrigated agriculture, CAFOs, and tree farms present in the study corridor for the Applicant's Proposed Action Alternative and all other alternatives and route variations in Segment 6. Existing agriculture present in Segment 6 includes fallow/Idle cropland, field crops, orchards of fruit and tree nuts, and grassland/pasture. There are no vegetable operations, tree farms, or CAFOS present. There are no critical groundwater areas, but water rights are still obtained by farmers for irrigation. Data are not available to indicate how much land is sprayed with pesticides, but it is anticipated that all cultivated land could be sprayed.

Table 3-320 identifies crops in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 6. Table 3-321 identifies irrigated farmland in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 6. Refer also to MV-16.

Table 3-320. Inventory Data for Crop Types in Segment 6—Treasure Valley								
Alternative Route	Total Length (miles)	Crop Type Crossed (acres)						Confined Animal Feeding Operations (count)[3]
		Fallow/ Idle Cropland[1]	Field Crops[1]	Fruit and Tree Nuts[1]	Grass/ Pasture[1]	Vegetables[1]	Tree Farms[2]	
Applicant's Proposed Action	28.0	43	94	1	5,688	0	0	0
Variation S6-A1	*9.3*	*6*	*6*	*0*	*2,214*	*0*	*0*	*0*
Variation S6-A2	*8.9*	*16*	*79*	*0*	*2,550*	*0*	*0*	*0*
Variation S6-B1	*14.4*	*38*	*34*	*1*	*2,263*	*0*	*0*	*0*
Variation S6-B2	*14.1*	*15*	*4*	*0*	*1,736*	*0*	*0*	*0*

Table Notes:
These are for resource inventory within the B2H Project 1-mile-wide study corridor.
[1]Data source is the U.S. Department of Agriculture CropScape
[2]Data source is the Boardman Tree Farm as digitized from aerial imagery
[3]Data source is the Oregon Department of Agriculture confined animal feeding operations and self-reported dairies.

Table 3-321. Inventory Data for Irrigation Types in Segment 6—Treasure Valley (acres)						
Alternative Route	Total Length (miles)	Irrigation Type Crossed (acres)				
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Center Pivot Count[1]
Applicant's Proposed Action	28.0	2	1	136	0	1
Variation S6-A1	*9.3*	*0*	*0*	*0*	*0*	*0*
Variation S6-A2	*8.9*	*0*	*119*	*15*	*0*	*6*
Variation S6-B1	*14.4*	*0*	*0*	*36*	*0*	*0*
Variation S6-B2	*14.1*	*0*	*0*	*0*	*0*	*0*

Table Note: [1]Data source for this table includes cultivated farmland classified as dryland or as an irrigation type digitized from aerial imagery within the B2H Project 1-mile-wide study corridor for each alternative and variation. Center pivot count includes partial or full pivots within the 1-mile-wide study corridor for each alternative and variation.

Applicant's Proposed Action Alternative

The most common crop type present in the study corridor for the Applicant's Proposed Action is grassland/pasture. Some fallow/idle cropland, field crops, and orchards of fruit and tree nuts also are present. Most irrigated agriculture is irrigated with flood irrigation. There is 1 pivot in the study corridor.

Variations S6-A1 and S6-A2

Variation S6-A2 has more crops present in the study corridor than Variation S6-A1. Variation S6-A1 has no irrigated agriculture present in the study corridor, while Variation S6-A2 has pivot and flood irrigation, including 6 pivots.

Variations S6-B1 and S6-B2

Variation S6-B1 has more crops present in the study corridor and has flood irrigation, while Variation S6-B2 has no irrigated farmland present in the study corridor.

Important Farmland, High-value Soils, and Conservation Reserve Program Lands

This section examines important farmland, high-value soils, and CRP lands in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 6. Segment 6 contains prime farmland if irrigated, farmland of statewide importance, and high-value soils. No prime farmland or unique farmland is present in this study corridor for the alternatives and route variations in Segment 6. Table 3-322 identifies the important farmland and high-value soils present in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 6. Refer also to MV-17.

Table 3-322. Inventory Data for Important Farmland and High-Value Soils in Segment 6—Treasure Valley (acres)

Alternative Route	Total Length (miles)	Important Farmland (acres)		High-Value Soils[3] (acres)
		Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	
Applicant's Proposed Action	28.0	2,589	1,963	2,793
Variation S6-A1	*9.3*	*280*	*344*	*487*
Variation S6-A2	*8.9*	*427*	*681*	*788*
Variation S6-B1	*14.4*	*1,490*	*1,796*	*1,190*
Variation S6-B2	*14.1*	*1,383*	*1,214*	*1,316*

Table Notes: These are for resource inventory within the B2H Project 1-mile-wide study corridor.

[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data.

[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained.

[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Also, lands enrolled in the USDA CRP are present in Segment 6. CRP data were not available in a format to allow an inventory for each alternative and route variation in Segment 6. Rather, data were available by county (refer to Table 3-323). In 2014, there were 318 acres of CRP lands in counties crossed by alternative routes and segments in Segment 6. However, no CRP lands are crossed by the Applicant's Proposed Action or any of the alternative routes or variations in Segment 6.

Table 3-323. County Conservation Reserve Program Acres Enrolled 2010-2014 in Segment 6—Treasure Valley

County	2010	2011	2012	2013	2014
Malheur	341	358	358	358	318
Owyhee	0	0	0	0	0

Table Note: Data is sourced from the U.S. Department of Agriculture Farm Service Agency Conservation Program index at http://www.fsa.usda.gov/programs-and-services/conservation-programs/reports-and-statistics/conservation-reserve-program-statistics/index.

Applicant's Proposed Action Alternative

Farmlands present in the study corridor include prime farmland if irrigated, and farmland of statewide importance, in addition to high-value soils.

Variations S6-A1 and S6-A2

Variation S6-A2 has more prime farmland if irrigated, farmland of statewide importance, and high-value soils present in the corridor.

Variations S6-B1 and S6-B2

Variation S6-B1 has more prime farmland if irrigated and farmland of statewide importance, but less high-value soils present in the corridor than S6-B2.

Livestock Grazing

This section examines grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternatives and route variations in Segment 6. Grazing allotments relevant to Segment 6 include Alkali-Wildcat, Board Corrals, Canal, Elephant Butte, Graveyard Point, Hardtrigger, Poison Creek, Rats Nest, Reynolds Creek, and Strodes Basin (managed by the BLM). Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Note that while this discussion is identifying all allotments within a half mile of the alternative routes and variations, Appendix G identifies only those allotments actually crossed by the alternative routes and variations, which is why allotments may be included here, but not listed in the appendix as being affected by the B2H Project.

Table 3-324 identifies the acres of BLM- administered grazing allotments in the study corridor for the Applicant's Proposed Action Alternative and other alternative and route variations in Segment 6. Refer also to MV-18.

Table 3-324. Inventory Data for Grazing Allotments in Segment 6—Treasure Valley						
Alternative Route	**Total Length (miles)**	**Bureau of Land Management Field Office**	**Number of Allotments Crossed[1,3]**	**Active Animal Unit Month[1,3]**	**Total Allotment Acres[1,4]**	**Acres in the Study Corridor[1,5]**
Applicant's Proposed Action	28.0	Malheur Field Office	1	4,182	60,955	1,905
		Owyhee Field Office	9	9,900	116,551	13,990
Variation S6-A1	*9.3*	*Malheur Field Office*	*1*	*4,182*	*60,955*	*1,340*
		Owyhee Field Office	*3*	*2,847*	*23,994*	*4,084*
Variation S6-A2	*8.9*	*Malheur Field Office*	*1*	*4,182*	*60,955*	*722*
		Owyhee Field Office	*3*	*2,847*	*23,994*	*3,576*
Variation S6-B1	*14.4*	*Owyhee Field Office*	*7*	*7,793*	*97,837*	*9,053*
Variation S6-B2	*14.1*	*Owyhee Field Office*	*7*	*7,793*	*97,837*	*9,061*

Table Notes:
[1]Data source is the U.S. Forest Service and the Bureau of Land Management grazing allotments datasets.
[2]Number of allotments crossed by the B2H Project 1-mile-wide study corridor.
[3]Active animal unit months of allotments crossed by the B2H Project 1-mile-wide study corridor.
[4]Total acres of allotments that are crossed by the B2H Project 1-mile-wide study corridor (including areas of allotments outside of the study corridor).
[5]Acres of allotments present in the B2H Project 1-mile-wide study corridor.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action has 10 allotments and 15,895 acres present in the study corridor. These allotments are permitted for 14,082 AUMs.

Variations S6-A1 and S6-A2

These route variations have the same 4 allotments present in the 1-mile-wide study corridor, but Variation S6-A1 has 1,126 more allotment acres present in the study corridor.

Variations S6-B1 and S6-B2

These route variations have the same 7 allotments present in the 1-mile-wide study corridor, but Variation S6-B2 has 8 more allotment acres in the study corridor.

3.2.7.6 Environmental Consequences (Results of Analysis)

This section generally describes the environmental consequences of the Applicant's Proposed Action Alternative and other alternatives and route variations on agriculture. The impacts of each of the alternatives to the Proposed Action are discussed in this section, which is organized by segment and the alternatives that occur within each segment. Impacts of the alternatives are compared to the Proposed Action to illuminate the differences, including advantages and disadvantages of each alternative.

Types of Potential Effects

This section discusses the types of impacts that would occur with construction, operation, and maintenance of the B2H Project. For information related to agricultural economic impacts, refer to Section 3.2.17.

Existing Agriculture

Crop Production and Confined Animal Feeding Operations

The B2H Project components, including towers, communication sites, and substations, could temporarily or permanently displace some current agricultural uses.

Construction effects on crop production could include:

- Temporary disruption of the current use during the construction period: Existing crops in cultivated farmland would be temporarily disturbed to enable construction of B2H Project facilities, such as tensioning and pulling sites and access roads for construction equipment.
- Interruption of planting schedules: Because of limited time frames for seeding particular crops, landowners could lose an entire year of crops in construction areas if construction schedules affected planting season.

The Applicant would have the right for ingress and egress necessary for maintenance purposes, including cutting, trimming, and removal of trees or other obstructions that could interfere with the operation, maintenance, and repair of B2H Project facilities. Thus, operation and maintenance effects on agriculture could include:

- Maintenance access: this could require driving over fields to access the transmission towers or other facilities, interfering with operations and damaging crops.
- Land-use restrictions: these could prevent the erection or placement of any building or structure or the storage of flammable material in the right-of-way.
- Vegetation restrictions limiting the types of crops that can grow in the right-of-way based on vegetation height: Over the long term, tall vegetation would be managed as specified in Section 2.3.2, System Construction. Vegetation management involves two zones. First, the wire zone, which is a linear area under the wire and extends 10 feet to the outermost of the most outside wire. In the wire zone, vegetation must remain under 5 feet. Second, the border zone, which extends from the wire zone to the right-of-way. Vegetation can grow up to 25 feet in the border zone. The Applicant would remove all tree species within the right-of-way when the conductor ground clearance is less than 50 feet. Conductor clearance on the B2H Project is typically 40 feet.
- Machinery restrictions: Most farm machinery, including plowing and harvesting equipment, can work underneath conductors and up to bases of structures. However, some logging machinery, such as log loaders or feller bunchers, could be too tall to work under conductors, particularly when carrying logs.
- Removal of land from crop production: Structures typically occupy approximately 2,500 square feet but require 62,500 square feet of temporary disturbance to construct. Depending on the route selected, some acreage would be taken out of production under transmission structures, and the support structures would be in the way of farm equipment. There could be an additional loss of crop production if structures are set close to the edge of a field, but not outside the field, so that farm equipment cannot fit between the structure and the edge of the field.

- Stagnant land susceptible to invasive species: Areas under structures that are not in production would be susceptible to invasive species and pest infestations, which could spread to nearby crops.
- Increased production costs: The diversion of equipment around structures, reduction of cultivated areas, and the additional time needed to accommodate structures reduces efficiency of farming practices.
- CAFO NPDES permits: The development of the B2H Project could affect the CAFO NPDES permits or comprehensive nutrient management plans because the area that could be treated with manure would be reduced, thus affecting the ratio of animal units to crop area. Additionally, infrastructure for applying the manure is located in crop fields and in circle pivot corners, which could be affected by the B2H Project (EPA 2010).
- Growth-induced effects: a long-term, indirect impact on crop production and CAFOs could be the potential for growth-induced effects related to adding facilities and creating a utility corridor where one does not previously exist. Oregon law promotes siting new transmission lines where transmission lines currently exist. Thus, future transmission lines could be colocated with this transmission line, further affecting crop production and CAFOs. Potential for induced development would depend on city and county planning and zoning authorities. Refer to Section 3.2.6 Land Use for a discussion of compliance of the B2H Project with zoning and land-use plans.
- Interruption of GPS signals: GPS devices, such as those in farm equipment, generally use signals from multiple satellites. They also may use a base station to pull a signal from. If an object, such as a tower structure or conductor, is placed between the base station and the GPS unit, it could temporarily interrupt or scatter the satellite signal. However, corona-generated interference would most likely not affect GPS units since GPS units operate at frequencies of 1757.42 megahertz and 1227.6 megahertz and transmission lines have a frequency of 60 hertz in the U.S. The potential for interference from corona effects is greater in rainy weather. In addition, GPS units typically pull from multiple satellites; if one object is in the path of the signal, it automatically compensates by pulling a signal from another satellite (DOE and State of Montana DEQ 2008).
- Interference with Global Navigation Satellite Systems: These agricultural navigation systems are used in farming equipment in the B2H Project area (as indicated by comments on the Draft EIS). A study published in 2012 in the journal Computers and Electronics in Agriculture studied the effects of two 500-kV DC lines and one 230-kV AC line on global navigation satellite systems used by agricultural producers. The study concluded that only obstructions of signals caused by conductors and towers, caused by brief masking of the transmission line facilities created nonimpeding affects (Bancroft et al. 2012).

Irrigated Agriculture

In general, the potential impacts on irrigated agriculture could be greater than effects on dryland because irrigated agriculture requires more infrastructure and more intensive farming operations than

dryland farming. Construction activities for the B2H Project could have more impact on irrigated agriculture than operation activities. Construction impacts could include:

- Interruption of water delivery: Construction activities could temporarily affect the ability of agricultural operations to bring water to their crops if agricultural operators are unable to access or maintain irrigation infrastructure, such as irrigation pumps or canals
- Interrupted irrigation schedules: Similar to the potential effects on crop production and CAFOs, construction of B2H Project facilities, such as access roads and structures, could affect irrigation schedules, interrupting irrigation application.

Operation and maintenance potential effects on irrigation systems could include:

- Safety Issues: Spray-type irrigation systems (such as those used in pivot or other mechanized irrigation systems) and flood irrigation systems typically are not hazardous when used under transmission lines. Irrigation pivots could spray underneath transmission lines, including high profile pivots. Pivots usually have a gun located at the outermost part, which increases the spray coverage (Tam and Petersen 2014). However, water from irrigation guns could be unsafe if allowed to contact transmission line conductors. Irrigation guns are typically used in pastures or at the end of pivots, and have flowrates that exceed 50 gallons per minute (Tam and Petersen 2014). Conductors at their lowest points would be 37 feet aboveground, which should be above end gun water stream. Water hitting the transmission towers is not an issue. Prior to construction of the B2H Project, the Applicant would discuss with property owners potential hazards with current and future irrigation systems, and how they could be addressed (Idaho Power Company n.d.a).
- Water use and water rights: In some areas in the study corridor, water use and water rights are highly regulated. Because water rights are tied to specific lots of land, irrigation systems on farmland cannot be relocated to other farmland not listed in the right unless it follows a transferring process. Water must be used or risk forfeiture. Thus, removing acres from irrigation reduces the ability of landowners to use water appropriated to them. As introduced in the regulatory framework, critical groundwater areas in Morrow, Umatilla, and Malheur Counties will not allow new water rights. If these water rights are lost, it is possible that they may not be reobtained (Ward 2010).
- Irrigation infrastructure: Tower structures and other B2H Project facilities could be located to inhibit the normal movement of irrigation infrastructure. For example, in the case of a pivot, this would result in a Pac-Man© shaped field or in shortening of the pivot arm. Corners of fields also may contain irrigation wells and pumping equipment, which could have reduced access if B2H Project facilities are colocated with them. Irrigation infrastructure could need reconfiguring.
- Reduced ability to add future irrigation systems or expand current irrigation systems: Pivots can be equipped with cornering systems to take advantage of an entire square quarter section of land. Because water rights are tied to specific plots of land, these corners also are ideal locations for increased crop production, as opposed to separate plots of land. If tower structures

are located in these undeveloped areas, it limits landowners' future ability to develop these areas.

- Interruption of GPS equipment: Auto steering tractors and irrigation systems could have GPS signals interrupted, which could halt or interrupt the movement of the equipment.

The greatest potential effects on irrigation would be associated with center pivots. Center pivot systems consist of a single lateral pipe supported by trusses on wheels with one end anchored to a fixed point and the other end free to move in a circle around the pivot point. Lengths of the lateral pipe range from 200 to 2,600 feet. In some instances, irrigation infrastructure is located within pivot corners, making some corners unsuitable for placement of structures.

Pivots are generally less labor intensive and distribute water more efficiently than other irrigation types. They operate most efficiently and distribute water most effectively when they complete the entire circle and continue in the same direction on a permanent basis. If a B2H Project tower structure is placed in the path of a pivot, the pivot can be programmed to reverse its direction, resulting in Pac-Man© shaped fields. When reversing direction is required, the frequency of application to a specific ground site becomes imbalanced depending on where in the arc of the pivot circle the site is located. For example, assume a pivot is programmed to complete its entire circle in 24 hours in the same direction on a continual basis. Each site in the circle is watered every 24 hours. If it is required to reverse its path due to a structure preventing it from completing the entire circle, the frequency of application on each end of the path will be 48 hours, and the frequency would be 24 hours halfway around the circle. Such imbalanced application could significantly affect crop production. Alternatively, the pivot direction could be reversed, with no water applied, to its starting point. Each cycle would start and water would be applied going in one direction, resulting in a 12-hour period of no water application.

A B2H Project tower structure located near the outer end of a center pivot could require a lateral arm to be shortened, thereby reducing the area covered by the pivot for its entire circumference. As an example, a 100-foot reduction in the length of the pivot arm would reduce the area covered by approximately 18 acres. Also, B2H Project conductors cannot come in contact with end guns for safety reasons. However, some specific types of pivot irrigation systems are capable of irrigating fields with variable boundaries, or obstacles in the path of a traditional pivot (Zimmatic 2011).

Wheel-line systems (also known as "wheelmove" or "sideroll" or "lateral-roll irrigation machines") are composed of the mover, lateral pipe, wheels, sprinklers, couplers, and connectors to the mainline supply. System lengths vary, but most are 1,280 feet long and made up of sections of pipe that can be disassembled. Wheels on these systems vary from 5 to 10 feet in diameter and are connected using a lateral pipe that acts as both the axle and transporter of water to the sprinklers. Sprinklers on these systems are normally impact sprinklers. The power mover, which drives the system, is mounted in the center of the wheel-line system. One end of the lateral pipe connects to the pressurized mainline pipe using a flexible hose. Outlet valves are located along the field to be irrigated at particular intervals. The operator of the system connects the flexible hose to these valves. During operation of the wheel-line system, the entire wheel-line system is driven by the operator down the field to where land needs to be irrigated. Alternatively, they may be self-driven using an automated guidance system or GPS. The hose

is connected to the valve, land is irrigated, and then the operator can again start the motor of the mover, and roll the system to the next area to be irrigated If the wheel-line system is automated, it travels the length of the field similarly to a pivot, except in a linear pattern, as opposed to a rotational pattern (Harrison et al. 2015; Hill 2000; Lake Company 2016).

Wheel-line systems could have to be reconfigured if a B2H Project tower structure is placed in its path for irrigation. Alternatively, for each irrigation cycle, the system could be partially disassembled, moved around the tower, and then reassembled for continued operation. However, this scenario would result in an indefinite inconvenience and increased labor costs.

Flood or surface irrigation is gravity-fed watering of fields where the surface of the field is the means of distributing the water. Water, usually supplied from canal systems operated by public or semi-public irrigation departments, is conveyed to fields using canals, lined ditches, open channels, or pipelines, and then flows across the field surface with a variety of methods that have been termed as "uncontrolled flooding," "basin irrigation," "border irrigation," and "furrow irrigation." These methods use a variety of techniques, such as dykes, siphons, furrows, surge flow, sloping or leveling of a field, among others, to control the uniformity and efficiency of water flow across a field, in addition to achieving adequate infiltration appropriate for the crop (Economic Research Service 2013; Food and Agricultural Organization of the United Nations n.d.).

Flood irrigation systems that perform optimally take care to precisely prepare fields, schedule irrigation, regulate inflow discharges, and control tail water runoff. Controlling tail water runoff involves collecting water that has flowed across the field, and pumping to the inlet of the field, where it is again released across the field (Food and Agricultural Organization of the United Nations n.d.).

Potential effects of the B2H Project on any type of flood irrigation system would be similar. Construction of B2H Project facilities, such as structures or access roads, could affect precise grades of fields and disrupt flow of water across fields although the Applicant would reclaim all access roads to landowner specifications. Structures placed in flood-irrigated fields could have long-term impacts on the irrigation, as footings and grading of soils at the base of the structure would interrupt flow of irrigation water across the field.

Potential effects on dryland farming would be the least of any irrigation system as it does not involve any irrigation system and, thus, impacts on irrigation of dryland farming are low. Potential effects on crops grown using dryland farming methods are discussed under crop production and CAFOs.

Finally, a long-term, indirect impact on irrigated farmland could be the potential for growth-induced effects related to creating a utility corridor where one does not previously exist. Oregon law promotes siting new transmission lines where transmission lines currently exist. Thus, future transmission lines could be colocated with this transmission line, further affecting irrigated farmland. Potential for induced development would depend on city and county planning and zoning authorities. Refer to Section 3.2.6 Land Use for a discussion of the B2H Project compliance with zoning and land-use plans.

Application of Pesticides and Aerial Spraying

The application of pesticides (crop dusting) is common in the B2H Project area and the construction of the B2H Project could have a temporary and long-term direct impact on crop spraying. Both ground application and aerial spraying methods are used. Some pesticides/herbicides can only be applied effectively by air. A field can receive multiple applications per year depending on the type of crop and preferences of individual operators. Additionally, some crops are aerially seeded.

Construction potential effects include:

- Interruption of spraying/seeding schedules: construction activities could affect timing of spraying and seeding activities

Operation and maintenance potential effects include:

- Reduced spray coverage uniformity: Spray coverage uniformity could be affected by the presence of the B2H Project tower structures and transmission line. Crop dusters must maintain a minimum 10-foot distance from transmission structures (Idaho Power Company n.d.b). In some cases, by maintaining a safe lateral distance from the B2H Project, the product may not adequately cover the crop under the transmission line. In this case, the desired results of controlling weeds, insects, or diseases could be reduced, as would uniform seeding.
- Safety for aerial applicators: Personnel operating sprayers are at increased risk for coming in contact with obstacles such as conductors or tower structures.
- Inability to access landing strips used for aerial spraying: depending on the action alternative, construction of the B2H Project could make landing strips unusable.
- Potential for not completely eradicating pests: Because of the reduced spray coverage uniformity that could occur, areas of land could be missed while spraying.
- Crop damage: Because of the reduced spray coverage uniformity that could occur, crops may be sprayed two or more times, which could damage crops.

In general, it is difficult to achieve uniformity of application of pesticides, fertilizer, and seed around transmission tower structures when ground application techniques or aerial spraying/seeding is used. Further, after a ground application is made around a tower it is difficult on the next pass for the operator to determine where the outer edge of the spray application was made and align the sprayer to avoid overlapping; consequently, double spraying could occur. Depending on the product, this could result in crop damage.

Aerial spraying involves dry application (usually fertilizer) and liquid applications of fungicides and pesticides. Fixed-wing aircraft typically carry 3,000 pounds of dry fertilizer or 500 gallons of liquid mixtures. Helicopter loads vary considerably depending on the type of craft. Effective ranges for spray aircraft are normally 25 to 30 miles. Nearly all of the spraying is done during daylight hours.

Landing strips used by aerial operators currently exist at several locations in the study corridor, and the aerial applicators have expressed concern about the B2H Project affecting their operations. Operators sometimes use landing strips other than their own to maintain some degree of efficiency. Landing strips

used need to have ample clearance at each end of the runways due to the heavy loads carried by the aircraft. Due to the reliance that crop producers place on them, aerial applicators are vital to the local economy.

During construction, applicators might need to modify spray patterns due to construction activities. The presence of construction workers could delay applications. The presence of the B2H Project also would increase the risk to aerial applicators. Tower guy wires are not proposed for the B2H Project, which is a safety advantage to aerial applicators because guy wires are difficult to see and cover a larger ground space than towers without them. Aerial spraying near hills and ridges can cause downdrafts and updrafts, which could increase risks to the applicator if the B2H Project is located near this type of terrain.

If the B2H Project is located along the edges of fields, existing roadways, or natural boundaries rather than through existing fields, there would be less risk to the applicator and more efficiency in product application, as well as more land being used to its capacity compared to where the B2H Project crossed a portion of a field. Also, if the B2H Project crossed a field at an odd angle, it could be more difficult to maintain a uniform application. The Applicant would work with land owners to locate the transmission line to run parallel to crop duster paths (Idaho Power Company n.d.b).

In summary, potential effects on the ability of aerial applicators to safely provide services could be increased cost, reduced efficiency and uniformity, increased potential for not completely eradicating pests (which could lead to pesticide resistance), potential damage to crops from ground applications, and lower crop yields.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

Important farmland and high-value soils within the construction areas could be temporarily unavailable for agricultural uses during construction of the B2H Project. However, except for footprints of permanent facilities, agricultural uses could resume when the construction in the area is completed.

Potential effects of construction activities (e.g., creation of access roads, work areas, staging, and wire pulling/splicing) could include:

- soil erosion,
- damage to agricultural land soil drainage,
- the mixing of topsoil and subsoil,
- the loss of topsoil,
- soil compaction.

However, reclamation measures would keep disturbed prime farmland soil losses to a minimum. Construction areas not to be used for operations would be reclaimed as soon as possible following construction.

Potential effects from operation and maintenance include:

- The long-term occupation of important farmland and high-value soils by B2H Project tower structures resulting in the conversion of these soils to nonagricultural uses: Approximately 4 structures per mile would be installed. Self-supporting lattice towers occupy a 50 x 50-foot area at ground level, but require 250 x 250 feet of construction disturbance to soils. The important farmland and high-value soils under the structures would be lost to production. The area of loss of important farmland and high-value soils would be less than the temporary disruptions resulting from construction activities, but would be for a longer time interval, 50 years or more compared to the 36-month construction period.
- Potential for growth-induced effects related to creating a utility corridor where one does not previously exist: Oregon law promotes siting new transmission lines where transmission lines currently exist. Thus, future transmission lines could be colocated with this transmission line, further affecting important farmland and high-value soils. Potential for induced development would depend on city and county planning and zoning authorities. Refer to Section 3.2.6 Land Use for a discussion of compliance of the B2H Project with zoning and land-use plans.

Lands in CRP contracts would have impacts determined on a contract by contract basis and would follow procedures outlined in the Conservation Reserve Program Handbook, 2-CRP (rev. 5) Par. 572 B, Land Acquired Under Eminent Domain. This would be considered an involuntary loss of CRP acres for public use. Potential effects on CRP acres could include the loss of acres in particular contracts. The Farm Service Agency would determine which areas could not remain in the CRP. Areas that could not remain in CRP are locations of permanent B2H Project facilities (tower structures, stations, permanent access roads). All remaining land can remain in the contract. No refunds would be required of the producers, but annual payments would be reduced commensurate with the number of acres removed from the contract (Farm Service Agency 2015b; Kelly Worley, Conservation Program Specialist, personal communication with author, May 2, 2016).

Livestock Grazing

Grazing occurs on public and private lands in the study corridor, and is a source of income for private landowners. Both the USFS and BLM manage livestock grazing on active allotments in the study corridor. States also lease land for grazing and have similar systems in place for management of grazing leases. Note, except where federally managed grazing allotments occur on private land and where land is zoned as Exclusive Range Use, impacts on grazing on private land are not analyzed in this EIS because data to identify where grazing is occurring are unavailable.

Rangeland is used for feeding grazing animals during allocated times of the year. Grazing allotments are designated primarily for grazing cattle and sheep. The BLM objective for grazing lands is to ensure the long-term health and productivity of these lands, and to create multiple environmental benefits that result in healthy watersheds. The BLM livestock grazing program is managed in accordance with Rangeland Health Standards.

The productivity of grazing lands is measured in AUMs, the amount of forage needed by a cow and a calf or one bull for one month. An AUM is generally produced from 10 to 20 acres, depending on forage

quality. The number of authorized AUMs on BLM and USFS-administered lands can vary depending on factors such as drought, wildfire, and market conditions, Additional information on BLM grazing management can be found in the *Fact Sheet on the Bureau of Land Management's Management of Livestock Grazing* at (BLM 2016).

USFS management objectives for livestock grazing generally include:

- To manage range vegetation to protect basic soil and water resources, provide for ecological diversity, improve or maintain environmental quality, and meet public needs for interrelated resource uses.
- To integrate management of range vegetation with other resource programs to achieve multiple-use objectives contained in Forest land and resource management plans.
- To provide for livestock forage, wildlife food and habitat, outdoor recreation, and other resource values dependent on range vegetation.
- To contribute to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for communities that depends on range resources for their livelihood.
- To provide expertise on range ecology, botany, and management of grazing animals.

Short-term impacts on grazing could result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Impacts on grazing operations would be limited to areas of construction activity, and could include:

- Potential spread of noxious and invasive plant species,
- Interference with livestock management,
- Increased potential for livestock theft because of improved access,
- Interference with access to livestock operations, and
- Potential increased mortality of livestock from increased traffic.

Long-term impacts on grazing could include the loss of vegetation available for livestock forage. During operations and maintenance, pasture and rangeland would be removed from grazing where they are occupied by support structures, stations, regeneration stations, or access roads.

In addition to impacts on grazing allotments, short- and long-term impacts could occur on active lambing and/or calving areas. Short-term impacts could include:

- A reduction or loss of lambing/calving areas due to disturbance and noise from construction and maintenance equipment, resulting in increased mortality.
- Separation of cattle/ewes from water or food sources due to construction activities. Such separation would cause the cattle/ewes to move and consequently separate mothers from their young, resulting in increased mortality.

NO ACTION ALTERNATIVE

If the No Action Alternative is selected, impacts on agriculture, including crop production, CAFOs, important farmland and high-value soils, CRP lands, and livestock grazing, would continue unaffected by the B2H Project. Changes in agricultural land use are anticipated over time but no changes would be created by the B2H Project.

EFFECTS COMMON TO ALL ALTERNATIVES

Effects common to all alternatives would be expected with creation of the B2H Project. Bonneville Power Administration owns the land proposed for the B2H Project's northern terminus, Longhorn Substation. All alternatives in Segment 1 would require the creation of this substation near Boardman, Oregon. This planned substation is expected to be 20 acres of permanent disturbance. BPA acquired the property from the Port of Morrow in a location where there was likely to be a future need for transmission facilities based on trends in load growth and customer requests. The Port of Morrow retains water rights associated with the land. The property is intersected by a corridor that contains three existing BPA transmission lines. The land is zoned for industrial use, including utilities, and BPA constructed, owns, and operates the Morrow Flat Substation within the property boundary. The proposed B2H northern terminus could occupy another section of the property. BPA has an active Land Use Agreement with the Port of Morrow allowing them to utilize some of the property for center pivot, irrigated agricultural production. BPA has reserved the right to terminate the Land Use Agreement in the future if and when the need arises to do so. The area around the center pivot irrigated land is degraded grassland habitat dominated by weed species.

Neither important farmland nor high-value soils are present on the land that would be occupied for the Longhorn Substation. Also, there are no federal grazing allotments present on the land that would be occupied by the Longhorn Substation. Data is not available to determine whether CRP contracts would be affected with creation of the Longhorn Substation.

Potential impacts on agricultural operations would be largely avoided through implementation of design features of the B2H Project for environmental protection (refer to Table 2-7). Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on livestock grazing would be low. Geotechnical testing would be coordinated with the landowner or lease. Overland travel on agricultural areas would be avoided unless approved by the landowner or leaseholder.

SEGMENT 1—MORROW-UMATILLA

Existing Agriculture

This section discloses impacts on existing agriculture in Segment 1 by alternative route and route variation. Table 3-325 presents the results related to existing agriculture. The data used to generate these results are displayed on MV-16. Table 3-326 presents the estimated long-term surface disturbance associated with each alternative and route variation. Table 3-327 presents estimated construction disturbance for the alternatives and route variations in Segment 1.

Table 3-325. Inventory Data and Residual Impacts for Crop Types and Irrigated Farmland in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Irrigation Type (miles crossed)				Crop Type or Confined Animal Feeding Operation (miles crossed)							Overall Residual Impacts (miles crossed)		
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Fallow/Idle Cropland[2]	Field Crops[2]	Fruit and Tree Nuts[2]	Grass/Pasture[2]	Vegetables[2]	Tree Farms[3]	Confined Animal Feeding Operation[4]	Low	Moderate	High
Applicant's Proposed Action	91.9	35.7	4.4	2.8	0.9	11.2	20.6	0.2	4.5	1.0	0.0	0.0	16.4	30.5	4.4
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.0*
East of Bombing Range Road	92.3	34	9.2	2.8	3.0	11.8	24.1	0.3	4.9	4.9	2.1	0.0	14.2	31.1	11.3
Applicant's Proposed Action – Southern Route	99.1	36.8	4.1	1.9	0.7	9.1	20.6	0.2	4.3	1.0	0.0	0.0	17.8	28.5	4.1
West of Bombing Range Road – Southern Route	95.6	18.6	3.1	0.2	1.2	6.9	9.9	0.2	4.5	0.7	0.0	0.0	10.4	15.5	3.1
Longhorn	88.2	27.0	9.1	2.8	2.4	11.0	19.8	1.1	4.9	2.9	0.9	3.5	14.5	27.8	9.9
Interstate 84	84.7	17.2	10.2	3.4	1.4	11.2	14.7	0.3	5.0	3.7	0.0	0.1	9.5	21.0	10.2
Variation S1-A1	*18.5*	*7.1*	*1.3*	*0.2*	*0.0*	*3.7*	*5.2*	*0.0*	*0.2*	*0.2*	*0.0*	*0.0*	*0.3*	*7.8*	*1.3*
Variation S1-A2	*18.5*	*2.2*	*0.9*	*0.4*	*0.5*	*3.1*	*1.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.1*	*0.0*	*3.5*	*0.9*
Interstate 84 – Southern Route	93.4	19.1	9.9	3.4	1.2	9.1	15.5	0.3	4.8	3.7	0.0	0.1	11.8	19.8	9.9

Table Notes:

[1]Data source includes cultivated farmland as seen in aerial imagery and classified as dryland or as an irrigation type. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[2]Data source includes U.S. Department of Agriculture CropScape. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[3]Data source is Boardman Tree Farm digitized from aerial imagery. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[4]Data source is Oregon Department of Agriculture confined animal feeding operations and self-reported dairies. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

Table 3-326. Estimated Long-Term Surface Disturbance of Crop Land and Irrigated Farmland in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Irrigated Farmland (acres)					Crop Type or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	91.9	200	25	16	5	45	63	115	1	25	6	0	0	210
Variation S1-B1	*6.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*3*
Variation S1-B2	*6.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*2*
East of Bombing Range Road	92.3	187	51	15	17	82	65	133	2	27	20	12	0	257
Applicant's Proposed Action – Southern Route	99.1	213	24	11	4	39	53	119	1	25	6	0	0	204
West of Bombing Range Road – Southern Route	95.6	128	21	1	8	31	48	68	1	31	5	0	0	153
Longhorn	88.2	154	52	16	14	82	63	113	6	28	17	5	20	251
Interstate 84	84.7	96	57	19	8	84	63	82	2	28	21	0	1	196
Variation S1-A1	*18.5*	*28*	*5*	*1*	*0*	*6*	*15*	*21*	*0*	*1*	*1*	*0*	*0*	*37*
Variation S1-A2	*18.5*	*15*	*6*	*3*	*3*	*12*	*20*	*7*	*0*	*0*	*2*	*0*	*1*	*30*
Interstate 84 – Southern Route	93.4	113	58	20	7	86	54	91	2	29	0	0	1	198

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-327. Estimated Extent of Construction Disturbance of Crop Land and Irrigated Farmland in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Estimated Construction Disturbance in Irrigated Farmland (acres)					Estimated Construction Disturbance of Crop Types or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/ Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	91.9	743	92	58	19	168	233	428	4	94	21	0	0	780
Variation S1-B1	*6.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*9*	*0*	*0*	*0*	*9*
Variation S1-B2	*6.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*6*	*0*	*0*	*0*	*6*
East of Bombing Range Road	92.3	704	190	58	62	311	244	499	6	101	75	43	0	969
Applicant's Proposed Action – Southern Route	99.1	777	87	40	15	141	192	435	4	91	21	0	0	743
West of Bombing Range Road – Southern Route	95.6	411	69	4	27	99	152	219	4	99	15	0	0	491
Longhorn	88.2	572	193	60	51	303	233	420	23	104	61	19	74	935
Interstate 84	84.7	363	215	72	30	317	236	310	6	106	78	0	2	738
Variation S1-A1	*18.5*	*138*	*25*	*4*	*0*	*29*	*72*	*101*	*0*	*4*	*4*	*0*	*0*	*181*
Variation S1-A2	*18.5*	*48*	*20*	*9*	*11*	*40*	*68*	*22*	*0*	*0*	*7*	*0*	*2*	*99*
Interstate 84 – Southern Route	93.4	407	211	72	26	309	194	330	6	102	79	0	2	714

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

In Segment 1, there are three critical groundwater areas, including the Ordnance Basalt, Stage Gulch, and Butter Creek critical groundwater areas. All alternatives in Segment 1 cross these areas. If a piece of land is removed from production, the water rights tied to it would be reduced. Impacts on farmland that is using water rights from these areas could include a reduction of water rights available where permanent B2H Project features exist. This is because water rights are tied to plots of land and no new water rights are being permitted in these areas. Because new water rights are no longer permitted in some of these areas, once lost, they cannot be reobtained. (Refer to Section 3.2.7.2 Regulatory Framework). No data are available for a comparison of alternatives and route variations.

Aerial and ground application of pesticides, in addition to aerial seeding could occur on any cultivated farmland in Segment 1. Impacts include obstruction of flight paths from the tower structures and conductors. There could be increased safety risks to operators navigating around tower structures and conductors. There also could be interruptions in spraying schedules as a result of construction activities, but the Applicant would coordinate with landowners to reduce these impacts. No data are available for a comparison of alternatives and route variations.

Applicant's Proposed Action Alternative

This alternative route crosses 4.4 miles of center pivot irrigation (Table 3-325) (Links 1-1, 1-3, 1-7, 1-27, 1-35, 1-45, 1-51, 1-63). The anticipated level of effects on center pivot irrigation would be high due to the direct, long-term interference with agricultural operations. However, on the Applicant's Proposed Action Alternative, the B2H Project could be micro-sited in these areas to avoid all existing center pivots with one exception. The Applicant's Proposed Action Alternative also crosses 30.5 miles of areas with flood and other mechanized irrigation (Links 1-27, 1-35, 1-45, 1-51, 1-60, 1-61, 1-63) which have moderate impacts due to interference with irrigation infrastructure such as permanent facilities affecting slopes in flood-irrigated agriculture.

The most common crops this alternative route crosses are fallow/idle cropland, field crops, fruit and tree nuts, and vegetables. The B2H Project would result in moderate effects on these resources, due to a direct short-term conflict with agricultural operations and removal of land from crop production.

An estimated 780 acres of construction disturbance and 210 acres of permanent disturbance in cultivated farmland would be required, most of which would occur in areas of dryland farming and field crops. An estimated 168 acres of construction disturbance and 45 acres of permanent disturbance would be required in irrigated farmland. This does not include disturbance associated with the additional action. Selective mitigation measures, such as micro-siting in coordination with the landowner, spanning, and reclaiming all access roads, would reduce these impacts.

No CAFOs or tree farms are crossed by this Applicant's Proposed Action Alternative.

Variations S1-B1 and S1-B2

Variation S1-B1 shares the same alignment as the Applicant's Proposed Action Alternative. Variation S1-B2 is similar to Variation S1-B1, except it crosses 0.1 mile less of grass/pasture.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

As described in Section 2.3.1, it is anticipated that the existing 69-kV transmission line, owned and operated by BPA, would be displaced by the proposed 500-kV transmission line and the 69-kV line would have to be relocated. As part of this additional action, the construction of the 230-kV from Wilson Lane south for 12.2 miles on the east side of Bombing Range Road would affect agricultural operations in this area. Due to height restrictions in the vicinity of the NWSTF Boardman, the tower structures would be no more than 100 feet tall, limiting the spans between towers from 400 to 600 feet. The right-of-way would be 55 feet wide. The current width of uncultivated land along the east of Bombing Range Road between Wilson Lane and Homestead Lane is approximately 50 to 55 feet wide. South of Homestead Lane, there is an existing distribution line that is already occupying this uncultivated land. The existing distribution line along the east side of Bombing Range Road would be buried or underbuilt on the newly constructed 230-kV line. It is expected that the Applicant could repurpose this uncultivated land for the 230-kV right-of-way, having minimal impacts on agriculture.

Design Option 2

Design Option 2 could have all impacts described under Option 1, as well as impacts that could result from the 230-kV transmission line following Bombing Range Road as it turns slightly east at the southeast corner of the NWSTF Boardman. This design option would parallel Bombing Range Road on the east side until it reaches the turn in the road, then it jumps the road and loosely parallels the road on the west side. It would weave through existing agriculture while heading west along the southern portion of the NWSTF Boardman to tie into the 69-kV transmission line. These impacts could include short-term construction disturbances and removing agriculture from production wherever B2H Project facilities are placed.

Design Option 3

Design Option 3 would have all impacts described under Option 2, as well as impacts that could result from the stepdown substation and connection of the 230-kV line to the Longhorn Substation. The existing agriculture impacts could include the long-term disturbance of field crops, vegetable operations, and fallow/idle cropland. Impacts on irrigated farmland could include temporary disturbance of pivot irrigation during construction. Long-term impacts could be expected on spraying and farming operations as operators will be required to work around permanent facilities.

East of Bombing Range Road Alternative

This alternative route would have the greatest impacts on agriculture in Segment 1 (Table 3-325 through Table 3-327); 11.3 miles of high impacts and 31.1 miles of moderate impacts would be expected. High impacts would be associated with long-term interference with agricultural operations such as pivot irrigation (Links 1-1, 1-3, 1-11, 1-25, 1-25, 1-33, 1-45, 1-51, 1-63). On the East of Bombing Range Road Alternative, the B2H Project could be micro-sited to avoid some existing center pivots; 23 existing center pivots would not be avoided. Placing B2H Project facilities in corners could limit the ability of farmers to expand irrigation systems. In addition, some of these pivot corners are already under irrigated crop production, making it impossible to span this irrigated agriculture.

High impacts also are associated with crossing the Boardman Tree Farm (Link 1-25). Under this alternative, the B2H Project would require for safety the removal of approximately 67 acres of trees from the entire right-of-way. Impacts on the tree farm would last until the B2H Project is decommissioned since height of the trees exceeds height restrictions.

Moderate impacts could include removing field crops (Links 1-3, 1-11, 1-25, 1-33, 1-41, 1-43, 1-45, 1-51, 1-53, 1-59, 1-60, 1-61, 1-63, 1-65), vegetable production (Links 1-11, 1-25, 1-33, 1-45), and orchards of fruit and tree nuts (Link 1-25) from production. These impacts would be reduced by spanning, micro-siting, and reclaiming all access roads.

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of irrigated farmland would be greater (143 additional acres of construction disturbance and 37 additional acres of permanent disturbance; refer to Table 3-326 and Table 3-327).

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of cultivated farmland would be greater (189 additional acres of construction disturbance and 47 additional acres of permanent disturbance. Refer to Table 3-326 and Table 3-327)

Same as the Applicant's Proposed Action Alternative, this alternative does not cross any CAFOs.

Applicant's Proposed Action – Southern Route Alternative

This alternative route has 2.3 fewer miles of high and moderate impacts than the Applicant's Proposed Action Alternative. This alternative route crosses 4.1 miles of center pivot irrigation (Links 1-1, 1-3, 1-7, 1-27, 1-35, 1-45, 1-51). The anticipated level of effects on center pivot irrigation would be high due to placement of structures in their operational paths. However, on this alternative route, the B2H Project could be micro-sited in these areas to avoid all existing center pivots with one exception. Placing B2H Project facilities in corners could limit the ability of farmers to expand irrigation systems. In addition, some of these pivot corners are already under irrigated crop production, making it impossible to span this irrigated agriculture and taking land out of production.

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of irrigated farmland would be less (27 fewer acres of construction disturbance and 6 fewer acres of permanent disturbance; refer to Table 3-326 and Table 3-327).

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of cultivated farmland would be less (37 fewer acres of construction disturbance and 6 fewer acres of permanent disturbance. Refer to Table 3-326 and Table 3-327).

Same as the Applicant's Proposed Action Alternative, this alternative does not cross any CAFOs.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The effects on agriculture from the design options would be the same as described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

This alternative route would have the least impacts on agriculture in Segment 1 (refer to Table 3-325 through Table 3-327). This alternative route crosses 3.1 miles of center pivot irrigation (Links 1-1, 1-3, 1-7, 1-27, 1-35). Under this alternative route, the B2H Project could be micro-sited in these areas to avoid all existing center pivots with one exception. Placing B2H Project facilities in corners could limit the ability of farmers to expand irrigation systems. In addition, some of these pivot corners are already under irrigated crop production, making it impossible to span this irrigated agriculture. If permanent B2H Project facilities are placed in the operational paths of irrigation systems, impacts on irrigated agriculture would be higher. Impacts could include short-term construction disturbances and removing agriculture from production wherever permanent B2H Project facilities are placed.

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of irrigated farmland would be less (69 fewer acres of construction disturbance and 14 fewer acres of permanent disturbance; refer to Table 3-326 and Table 3-327).

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of cultivated farmland would be less (289 fewer acres of construction disturbance and 57 fewer acres of permanent disturbance; refer to Table 3-326 and Table 3-327.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The effects on agriculture from the design options would be the same as described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Longhorn Alternative crosses two large concentrated CAFOs (3.5 miles) (Link 1-15). The B2H Project could affect the ability of landowners to comply with NPDES permits or comprehensive nutrient management plans for these CAFOs because long-term surface disturbance of 20 acres of the CAFOs would take land out of use. Thus, the CAFOs would have a smaller area for distributing manure, which could affect the ability of the CAFO to operate at its permitted capacity. The Applicant would work with the landowner to minimize impacts on NPDES requirements.

Infrastructure in pivot corners adjacent to CAFOs would make spanning of pivots along this alternative route more difficult. Additionally, because of the interlocking configuration of center pivots along this alternative route, spans between towers is more than 2,000 feet, and, thus, much taller structures would be required to span the pivots. However, because this area is in the avigation easement of the NWSTF Boardman, it is not likely that structures taller than 100 feet could be used and, thus, the pivots that are interlocked could not be spanned (about 6 pivots) and high impacts would be anticipated.

This alternative also crosses 0.9 mile of tree farms (Link 1-15). The B2H Project would remove 27 acres from production because of required conductor clearances (i.e., precluding tall vegetation growing underneath), resulting in a high level of impacts.

This alternative route crosses the most fruit and tree nut operations (Links 1-9, 1-15), which are perennial crops. Thus, vegetation clearing would have greater effects because of the need to replace vegetation that is not normally planted annually. Also, the amount of time for fruit and tree nuts to mature and bear fruit is much greater than an annual crop.

The nonlinear nature of this alternative route would make it difficult for aerial operators to safely apply pesticides, fertilizers, and seed to fields efficiently and uniformly.

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of irrigated farmland would be greater (135 additional acres of construction disturbance and 37 additional acres of permanent disturbance; refer to Table 3-326 and Table 3-327).

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of cultivated farmland would be greater (155 additional acres of construction disturbance and 41 additional acres of permanent disturbance. Refer to Table 3-326 and Table 3-327).

Interstate 84 Alternative

This alternative route crosses the most center pivot and flood irrigation compared to other alternatives and route variations in Segment 1, including 10.2 miles of high impacts and 21.0 miles of moderate impacts. High impacts include crossing center pivot irrigation (Links 1-5, 1-9, 1-19, 1-23, 1-31, 1-63). All pivots could be spanned. Moderate impacts include crossing flood and other mechanized irrigation (Links 1-23, 1-31, 1-63), as well as CAFOs (Link 1-23), field crops (Links 1-9, 1-19, 1-23, 1-31, 1-49, 1-63, 1-65), fruit and tree nuts (Links 1-9, 1-23), and vegetables (Links 1-9, 1-19, 1-23, 1-31). These impacts include, among others, disruption of farming operations and removing land from production.

This alternative also crosses the corner of one large concentrated CAFO (Link 1-23). However, no long-term disturbance would be expected because the CAFO could be spanned and avoided by tower structures. Temporary disturbance associated with construction could temporarily affect operations.

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of irrigated farmland would be greater (149 additional acres of construction disturbance and 49 additional acres of permanent disturbance; refer to Table 3-326 and Table 3-327).

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of cultivated farmland would be less (42 fewer acres of construction disturbance and 14 fewer acres of permanent disturbance; refer to Table 3-326 and Table 3-327).

Variation S1-A1

This route variation takes the same route as the Interstate 84 Alternative. It would have more than twice the combined moderate and high impacts of Variation S1-A2 mostly as a result of 4.2 more miles of field crops (Link 1-31), that would be crossed by this route variation. Compared to Variation S1-A2, it would require an additional 7 acres of long-term surface disturbance and 80 acres of construction disturbance of crops. However, this variation would require 6 fewer acres of long-term disturbance and 11 fewer acres of construction disturbance in irrigated agriculture compared to Variation S1-A2.

Variation S1-A2

This route variation crosses the corner of a large concentrated CAFO (Link 1-37). This could be spanned, though, and no long-term disturbance is expected of this CAFO. All pivot irrigation (Link 1-37) could be spanned on this alternative. The variation would be colocated with an existing H-frame transmission line, which could make it more difficult for farming operations to continue between structures.

Interstate 84 – Southern Route Alternative

If this alternative is selected, 9.9 miles of high impacts on areas with center pivot irrigation would be anticipated (Links 1-5, 1-9, 1-19, 1-23, 1-31). However, all of these pivots could be spanned, reducing impacts. Also, 19.8 miles of moderate impacts would be expected. Moderate impacts would include crossing a CAFO (Link 1-23), vegetables (Links 1-9, 1-19, 1-23, 1-31), fruit and tree nuts (Links 1-9, 1-23), field crops (Links 1-9, 1-19, 1-23, 1-31, 1-49, 1-65, 1-66, 1-83), other mechanized irrigation (Links 1-23, 1-66), and flood irrigation (Links 1-23, 1-31). Moderate impacts include temporary disruption of crop production and interference with irrigation schedules while construction takes place.

This alternative route crosses the same CAFO crossed by the Interstate 84 Alternative (Link 1-23) and the impacts on that CAFO would be the same.

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of irrigated farmland would be greater (141 additional acres of construction disturbance and 21 additional acres of permanent disturbance; refer to Table 3-326 and Table 3-327).

Compared to the Applicant's Proposed Action Alternative, estimates of construction and permanent disturbance in areas of cultivated farmland would be less (66 fewer acres of construction disturbance and 12 fewer acres of permanent disturbance. Refer to Table 3-326 and Table 3-327).

Conclusions

The East of Bombing Range Road Alternative would have the highest impacts on existing agriculture. Approximately 23 pivots could not be spanned with impacts on all categories of crop types, including tree farms. The Longhorn Alternative would have the next highest impacts, with 6 pivots that could not be spanned, in addition to crossing two CAFOs and a tree farm. The Interstate 84 Alternative and Interstate 84-Southern Route are similar, with the Interstate 84 – Southern Route avoiding more irrigated agriculture. The alternatives that would be least impactful to existing agriculture are the Applicant's Proposed Action, Applicant's Proposed Action – Southern Route, and the West of Bombing Range Road Alternatives, with the West of Bombing Range Road – Southern Route Alternative avoiding the most existing agriculture in Segment 1 of any alternative.

Important Farmland, High-value Soils, and Conservation Reserve Program Lands

The results of the analysis to assess the impacts of the B2H Project on important farmland, high-value soils, and CRP lands are presented in Table 3-328 through Table 3-330. Table 3-328 presents the results related to important and high-value soils. Table 3-329 presents the estimated long-term surface disturbance associated with each alternative and route variations. Table 3-330 presents estimates for

the extent of construction disturbance on important farmland and high-value soils to be required during construction for the alternatives and route variations in Segment 1. Finally, Table 3-331 presents the extent of CRP lands that would be crossed by the right-of-way of the B2H Project. Refer also to MV-17.

Table 3-328. Important Farmland and High-Value Soils in Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Applicant's Proposed Action	91.9	28.8	38.9	30.4
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	29.9	38.4	31.6
Applicant's Proposed Action – Southern Route	99.1	24.9	46.3	25.9
West of Bombing Range Road – Southern Route	95.6	21.1	36.9	21.5
Longhorn	88.2	22.2	39.1	23.4
Interstate 84	84.7	28.1	23.3	30.1
Variation S1-A1	*18.5*	*14.3*	*2.6*	*14.7*
Variation S1-A2	*18.5*	*4.3*	*9.3*	*5.0*
Interstate 84 – Southern Route	93.4	25.2	31.3	26.6

Table Notes:

[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data

[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained

[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Table 3-329. Estimated Long-Term Surface Disturbance of Important Farmland and High-Value Soils in Segment 1—Morrow-Umatilla (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	91.9	161	218	170
Variation S1-B1	*6.4*	*0*	*0*	*0*
Variation S1-B2	*6.4*	*0*	*0*	*0*
East of Bombing Range Road	92.3	164	211	174
Applicant's Proposed Action – Southern Route	99.1	144	269	150
West of Bombing Range Road – Southern Route	95.6	146	255	148
Longhorn	88.2	127	223	133
Interstate 84	84.7	157	130	169
Variation S1-A1	*18.5*	*57*	*10*	*59*
Variation S1-A2	*18.5*	*28*	*61*	*33*
Interstate 84 – Southern Route	93.4	149	185	157

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-330. Estimated Extent of Construction Disturbance of Important Farmland and High-Value Soils in Segment 1—Morrow-Umatilla (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	91.9	599	809	632
Variation S1-B1	*6.4*	*0*	*0*	*0*
Variation S1-B2	*6.4*	*0*	*0*	*0*
East of Bombing Range Road	92.3	619	795	654
Applicant's Proposed Action – Southern Route	99.1	525	977	546
West of Bombing Range Road – Southern Route	95.6	466	815	475
Longhorn	88.2	471	829	496
Interstate 84	84.7	593	492	635
Variation S1-A1	*18.5*	*279*	*51*	*287*
Variation S1-A2	*18.5*	*95*	*205*	*110*
Interstate 84 – Southern Route	93.4	537	667	567

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-331. Conservation Reserve Program Lands Crossed by the Right-of-Way in Segment 1—Morrow-Umatilla		
Alternative Route	**Total Length (miles)**	**Lands Enrolled in Conservation Reserve Programs (acres)**
Applicant's Proposed Action	91.9	355
Variation S1-B1	*6.4*	*0*
Variation S1-B2	*6.4*	*0*
East of Bombing Range Road	92.3	355
Applicant's Proposed Action – Southern Route	99.1	314
West of Bombing Range Road – Southern Route	95.6	144
Longhorn	88.2	355
Interstate 84	84.7	253
Variation S1-A1	*18.5*	*25*
Variation S1-A2	*18.5*	*62*
Interstate 84 – Southern Route	93.4	235
Table Note: The Farm Service Agency estimated the number of acres of Conservation Reserve Program lands crossed by the B2H Project 250-foot right-of-way. Conservation Reserve Program acres may be slightly over-reported. Acres have been rounded to the nearest whole number.		

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would require an estimated construction disturbance of 599 acres of prime farmland if irrigated, 809 acres of farmland of statewide importance, and 632 acres of high-value soils. This alternative route would require an estimated long-term disturbance of 161 acres of prime farmland if irrigated, 218 acres of farmland of statewide importance, and 170 acres of high-value soils. These impacts would occur generally on Links 1-27, 1-35, 1-43, 1-45, 1-50, 1-51, 1-53, 1-59, 1-60, 1-61, 1-63, 1-65, and 1-71. Vegetation clearing would increase the potential for soil loss due to erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

In Segment 1, this alternative route crosses the most land (355 acres) enrolled in CRPs (although the same extent as East of Bombing Range Road Alternative and Longhorn Alternative). Areas where construction disturbance occurs would be reclaimed and the CRP lands would remain under contract. However, acreages of footprints for permanent B2H Project facilities would be calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Variations S1-B1 and S1-B2

Variation S1-B1 follows a portion of the same alignment as the Applicant's Proposed Action Alternative. Neither variation crosses any important farmland, high-value soils or lands in CRP contracts.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

If the Applicant's Proposed Action Alternative were selected for construction, transmission lines around the Bombing Range Road would need to be reconfigured. Refer to the Project Description in Chapter 2

for more details. As part of this additional action, the construction of the 230-kV from Homestead Lane south for 8.5 miles on the east side of Bombing Range Road could affect prime farmland if irrigated, farmland of statewide importance, and high-value soils in this area. Due to height restrictions in the vicinity of the NWSTF Boardman, the tower structures would be 70 feet tall, limiting the spans between towers from 400 to 600 feet. However, because monopole tower structures would be used for this portion of the new 69-kV transmission line, the extent of important farmland and high-value soils potentially affected (e.g., converted to nonagricultural uses) would be minimized. Of the three options, this option would have the least effects on important farmland and high-value soils.

Design Option 2

This design option could include the impacts from Option 1. In addition, this option would require the construction of the 230-kV line on the east side of Bombing Range Road south of where the proposed B2H Project would cross the Bombing Range Road and along the south boundary of the NWSTF Boardman. It would cross important farmland and high-value soils. Effects would be potential for soil loss due to erosion and mixing of high-value topsoil with sub soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Design Option 3

This design option could include the impacts from Options 1 and 2. In addition, a stepdown substation south of the NWSTF Boardman would be required in addition to extending the 230-kV line across Interstate 84 to the Longhorn Substation. The location planned for the stepdown substation contains important farmland and high-value soils. Of the three options, this option would have the highest impacts on important farmland and high-value soils. Effects would be potential for soil loss due to erosion and mixing of high-value topsoil with sub soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

East of Bombing Range Road Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an additional estimated construction disturbance of 20 acres of prime farmland if irrigated, 14 fewer acres of farmland of statewide importance, and 22 more acres of high-value soils. This alternative route would require an additional estimated long-term disturbance of 3 acres of prime farmland if irrigated, 7 fewer acres of farmland of statewide importance, and 4 more acres of high-value soils. These impacts would occur generally on Links 1-25, 1-33, 1-41, 1-43, 1-45, 1-50, 1-51, 1-53, 1-59, 1-60, 1-61, 1-63, 1-65, and 1-71. Vegetation clearing would increase the potential for soil loss due to erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

The effects on CRP lands would be the same as described for the Applicant's Proposed Action Alternative (and the Longhorn Alternative).

Applicant's Proposed Action – Southern Route Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 74 fewer acres of prime farmland if irrigated, 168 additional acres of farmland of statewide importance, and 86 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 17 fewer acres of prime farmland if irrigated, 51 additional acres of farmland of statewide importance, and 20 fewer acres of high-value soils. These impacts would occur generally on Links 1-3, 1-27, 1-35, 1-43, 1-45, 1-51, 1-53, 1-59, 1-60, 1-65, 1-66, 1-71, 1-79, and 1-83. Vegetation clearing would increase the potential for soil loss due to compaction, erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Fewer CRP lands would be affected by this alternative than the Applicant's Proposed Action Alternative (41 acres, refer to Table 3-331).

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The effects on agriculture from the design options would be the same as described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

As presented in Table 3-328 through Table 3-330, this alternative route crosses the least prime farmland if irrigated and high-value soils of any alternative in Segment 1. Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 133 fewer acres of prime farmland if irrigated, 6 more acres of farmland of statewide importance, and 157 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 15 fewer acres of prime farmland if irrigated, 37 more acres of farmland of statewide importance, and 22 fewer acres of high-value soils. These impacts would occur generally on Links 1-27, 1-35, 1-36, 1-38, 1-62, 1-64, 1-65, 1-66, and 1-71. Vegetation clearing would increase the potential for soil loss due to compaction, erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

This route crosses the fewest CRP acres of any route in Segment 1 (211 fewer acres than the Applicant's Proposed Action Alternative).

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The effects on agriculture from the design options would be the same as described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 128 fewer acres of prime farmland if irrigated, 20 additional acres of farmland of statewide importance, and 136 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 34 fewer acres of prime farmland if irrigated, 5 additional acres of farmland of statewide importance, and 37 fewer acres of high-value soils. These impacts would occur generally on Links 1-15, 1-45, 1-50, 1-51, 1-53, 1-59, 1-60, 1-61, 1-63, 1-65, and 1-71. Vegetation clearing would increase the potential for soil loss due to compaction, erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

This alternative route would affect the same CRP lands as the Applicant's Proposed Action Alternative (355 acres, refer to Table 3-331).

Interstate 84 Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 6 fewer acres of prime farmland if irrigated, 317 fewer acres of farmland of statewide importance, and 3 more acres of high-value soils. This alternative route would require an estimated long-term disturbance of 4 fewer acres of prime farmland if irrigated, 88 fewer acres of farmland of statewide importance, and 1 fewer acre of high-value soils. These impacts would occur generally on Links 1-23, 1-31, 1-39, 1-49, 1-50, 1-63, 1-65 and 1-71. Vegetation clearing would increase the potential for soil loss due to compaction, erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Fewer CRP lands would be affected by this alternative than the Applicant's Proposed Action Alternative (102 acres, refer to Table 3-331).

Variations S1-A1 and S1-A2

Variation S1-A1 takes the same route as the Interstate 84 Alternative. Compared to Variation S1-A2, this alternative route would require an estimated construction disturbance of 184 additional acres of prime farmland if irrigated, 154 fewer acres of farmland of statewide importance, and 177 additional acres of high-value soils. This alternative route would require an estimated long-term disturbance of 29 additional acres of prime farmland if irrigated, 51 fewer acres of farmland of statewide importance, and 26 additional acres of high-value soils. Impacts associated with Variation S1-A1 would occur on Link 1-31, and impacts associated with Variation S1-A2 would occur on Link 1-37. Vegetation clearing would increase the potential for soil loss due to compaction, erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Variation S1-A1 crosses 37 fewer CRP acres than Variation S1-A2.

Interstate 84 – Southern Route Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 62 fewer acres of prime farmland if irrigated, 142 fewer acres of farmland of statewide importance, and 65 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 12 fewer acres of prime farmland if irrigated, 33 fewer acres of farmland of statewide importance, and 13 fewer acres of high-value soils. These impacts would occur generally on Links 1-23, 1-31, 1-39, 1-49, 1-50, 1-65, 1-66, 1-71, 1-81, and 1-83. Vegetation clearing would increase the potential for soil loss due to compaction, erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Fewer CRP lands would be affected by this alternative than the Applicant's Proposed Action Alternative (120 acres, refer to Table 3-331).

Conclusions

The two alternatives in Segment 1 with the least impacts on important farmland, high-value soils, and lands enrolled in CRPs are the West of Bombing Range Road – Southern Route Alternative, the Interstate 84 Alternative, and the Interstate 84 – Southern Route Alternative, as these alternatives cross the least miles of prime farmland if irrigated, farmland of statewide importance, high-value soils, and CRP lands. In contrast, the Applicant's Proposed Action Alternative, the East of Bombing Range Road Alternative, and the Applicant's Proposed Action – Southern Route Alternative cross the most miles of soils important to agriculture and lands under CRP contracts.

Livestock Grazing

This section discloses impacts on livestock grazing in Segment 1 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on livestock grazing are presented in Table 3-332. The data used to generate these results are displayed on MV-18. Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Estimated affected AUMs are based off of long-term disturbance on federal grazing allotments. Long-term impacts on AUMs would occur throughout all allotments crossed by a particular segment.

Table 3-332. Estimated Extent of Disturbance of Grazing Allotments in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Applicant's Proposed Action	91.9	4.6	23,472	23,472	2,275	96	26	<1
Variation S1-B1	*6.4*	*4.6*	*23,472*	*23,472*	*2,275*	*102*	*35*	*1*
Variation S1-B2	*6.4*	*3.7*	*44,678*	*32,258*	*4,843*	*79*	*26*	*3*
East of Bombing Range Road	92.3	4.6	23,472	23,472	2,275	95	25	<1
Applicant's Proposed Action – Southern Route	99.1	4.6	23,472	23,472	2,275	97	27	<1
West of Bombing Range Road – Southern Route	95.6	4.6	23,472	23,472	2,275	102	32	<1
Longhorn	88.2	4.6	23,472	23,472	2,275	98	26	<1
Interstate 84	84.7	6.5	34,736	34,736	2,287	137	36	<1
Variation S1-A1	*18.5*	*0.0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*18.5*	*0.0*	*0*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	93.4	6.5	34,736	34,736	2,287	138	38	<1

Table Notes:
[1]Data source is U.S. Forest Service and Bureau of Land Management grazing allotments datasets.
[2]Allotment miles crossed by the B2H Project centerline.
[3]Active animal unit months of allotments crossed by the B2H Project 250-foot right-of-way.
[4]Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction and long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing, including estimated AUMs affected. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description. Actual AUMs affected would be calculated and addressed during the permit renewal process.

Applicant's Proposed Action Alternative

As presented in Table 3-332, this alternative route crosses the same number of miles of allotments as several of the other alternatives (4.6 miles) (Link 1-77). Construction disturbance would affect less than 1 percent of the surface area of the allotments, which is expected to affect less than 1 AUM of the forage available to livestock in the allotment in the long term.

Variations S1-B1 and S1-B2

Variation S1-B1 follows the same route as the Applicant's Proposed Action and crosses an additional 0.9 mile of allotments over Variation S1-B2. This would result in an estimated 9 additional acres of long-term surface disturbance and an additional 23 acres of construction disturbance. However, in both

route variations, construction disturbance would affect less than 1 percent of the surface area of the allotment, which is expected to affect 1 AUM of the forage available to livestock in the allotment for the long term for Variation S1-B1 and 3 AUMs for Variation S1-B2. Impacts for Variation S1-B1 would occur on Link 1-77, and impacts for Variation S1-B2 would occur on Link 1-75.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1,2, and 3

There are no grazing allotments in the areas affected by the additional action, and, thus, no identifiable impacts on grazing allotments are expected.

East of Bombing Range Road Alternative

As presented in Table 3-332, this alternative route crosses the same number of miles as the Applicant's Proposed Action Alternative, the Applicant's Proposed Action-Southern Route Alternative, and the Longhorn Alternative (4.6 miles) (Link 1-77). Construction and long-term disturbance would be slightly lower in this alternative than the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

As presented in Table 3-332, this alternative route crosses the same number of miles as the Applicant's Proposed Action Alternative, the East of Bombing Range Road Alternative, and the Longhorn Alternative (4.6 miles) (Link 1-77). Construction and long-term disturbance would be slightly higher in this alternative than the Applicant's Proposed Action Alternative. Less than 1 percent of the surface area of the allotments would have construction disturbance, which is expected to affect less than 1 AUM of the forage available to livestock in the allotments for the long term.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

There are no grazing allotments in the areas affected by the additional action, and, thus, no identifiable impacts on grazing allotments are expected.

West of Bombing Range Road – Southern Route Alternative

As presented in Table 3-332, this alternative route crosses the same number of miles as the Applicant's Proposed Action Alternative, the Applicant's Proposed Action-Southern Route Alternative, and the Longhorn Alternative (4.6 miles) (Link 1-77). Construction and long-term disturbance would be slightly higher in this alternative than the Applicant's Proposed Action Alternative. Less than 1 percent of the surface area of the allotments would have construction disturbance, which is expected to affect less than 1 AUM of the forage available to livestock in the allotments for the long term.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

There are no grazing allotments in the areas affected by the additional action, and, thus, no identifiable impacts on grazing allotments are expected.

Longhorn Alternative

As presented in Table 3-332, this alternative route crosses the same number of miles as the Applicant's Proposed Action Alternative, the Applicant's Proposed Action-Southern Route Alternative, and the East of Bombing Range Road Alternative (4.6 miles) (Link 1-77). Construction disturbance would be slightly higher and long-term disturbance would be the same in this alternative as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

As presented in Table 3-332, this alternative route crosses grazing allotments for 6.5 miles (Links 1-23, 1-77), the most of any alternative, but the same as Interstate 84 – Southern Route. However, because of terrain, this alternative route would have slightly less long-term surface disturbance and construction disturbance than the Interstate 84 – Southern Route Alternative. Less than 1 percent of the surface area of the allotments would have construction disturbance, which is expected to affect less than 1 AUM of the forage available to livestock in the allotments for the long term.

Variations S1-A1 and S1-A2

These variations do not cross federal grazing allotments and, thus, no identifiable impacts are expected.

Interstate 84 – Southern Route Alternative

As presented in Table 3-332, this alternative route crosses grazing allotments for 6.5 miles (Links 1-23, 1-77), the most of any alternative, but the same as Interstate 84 Alternative. However, because of terrain, this alternative route would have the most long-term surface disturbance and construction disturbance of all alternatives. Less than 1 percent of the surface area of the allotments would have construction disturbance, which is expected to affect less than 1 AUM of the forage available to livestock in the allotments for the long term.

Conclusions

The alternative routes cross a similar number of miles of grazing allotments in Segment 1, with no alternative affecting more than 1 AUM. However Variation S1-B2 would affect 3 AUMs.

SEGMENT 2—BLUE MOUNTAINS

Existing Agriculture

This section discloses impacts on existing agriculture in Segment 2 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on existing agriculture are presented in Table 3-333. The data used to generate these results are displayed on MV-16.

Table 3-334 presents the estimated long-term surface disturbance associated with each alternative and route variation.

Table 3-335 presents estimated construction disturbance for the alternatives and route variations in Segment 2. No irrigated agriculture is crossed by any of the alternative routes or route variations in Segment 2.

Table 3-333. Inventory Data and Residual Impacts for Crop Types and Irrigated Farmland in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Irrigation Type (miles crossed)				Crop Type or Confined Animal Feeding Operation (miles crossed)							Overall Residual Impacts (miles crossed)		
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Fallow/Idle Cropland[2]	Field Crops[2]	Fruit and Tree Nuts[2]	Grass/ Pasture[2]	Vegetables[2]	Tree Farms[3]	Confined Animal Feeding Operation[4]	Low	Moderate	High
Applicant's Proposed Action	33.8	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.1	0.0	0.0	0.0	0.1	0.8	0.0
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*
Glass Hill	33.7	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.1	0.0	0.0	0.0	0.1	0.6	0.0
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.2	0.0	0.0	0.0	0.2	0.8	0.0

Table Notes:

[1]Data source includes cultivated farmland as seen in aerial imagery and classified as dryland or as an irrigation type. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[2]Data source includes U.S. Department of Agriculture CropScape. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[3]Data source is Boardman Tree Farm digitized from aerial imagery. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[4]Data source is Oregon Department of Agriculture confined animal feeding operations and self-reported dairies. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

Table 3-334. Estimated Long-Term Surface Disturbance of Crop Land and Irrigated Farmland in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Estimated Disturbance in Irrigated Farmland (acres)					Estimated Disturbance by Crop Type or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	33.8	0	0	0	0	0	0	6	0	1	0	0	0	7
Variation S2-A1	*2.8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*2.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*3.7*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Variation S2-B2	*3.8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*9.3*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Variation S2-C2	*8.8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*1*
Variation S2-E1	*2.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*2.6*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Variation S2-F1	*12.1*	*0*	*0*	*0*	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*4*
Variation S2-F2	*12.2*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Glass Hill	33.7	0	0	0	0	0	0	4	0	1	0	0	0	5
Variation S2-D1	*4.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*4.1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	34.0	0	0	0	0	0	0	6	0	2	0	0	0	8

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-335. Estimated Extent of Construction Disturbance of Crop Land and Irrigated Farmland in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Estimated Construction Disturbance in Irrigated Farmland (acres)					Estimated Construction Disturbance of Crop Types or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/ Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	33.8	0	0	0	0	0	0	18	0	2	0	0	0	20
Variation S2-A1	*2.8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*2.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*3.7*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*2*
Variation S2-B2	*3.8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*9.3*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*2*
Variation S2-C2	*8.8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*2*
Variation S2-E1	*2.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*2.6*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*2*
Variation S2-F1	*12.1*	*0*	*0*	*0*	*0*	*0*	*0*	*13*	*0*	*0*	*0*	*0*	*0*	*13*
Variation S2-F2	*12.2*	*0*	*0*	*0*	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*4*
Glass Hill	33.7	0	0	0	0	0	0	13	0	2	0	0	0	15
Variation S2-D1	*4.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*4.1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	34.0	0	0	0	0	0	0	18	0	5	0	0	0	23

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Aerial and ground application of pesticides, in addition to aerial seeding could occur on any cultivated farmland in Segment 2. Impacts include obstruction of flight paths from the tower structures and conductors. There could be increased safety risks to operators navigating around tower structures and conductors. There also could be interruptions in spraying schedules as a result of construction activities, but the Applicant would coordinate with landowners to reduce these impacts. No data are available for a comparison of alternatives and route variations.

Applicant's Proposed Action Alternative

This alternative has 0.8 mile of moderate impacts due to crossing field crops (Links 2-35, 2-45, 2-75, 2-85). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. They would be mitigated using micro-siting and coordination with the landowner. Long-term disturbance is estimated to be 6 acres of field crops and construction disturbance is estimated to be 18 acres of field crops.

Variations S2-A1 and S2-A2

These route variations do not cross moderate or high impacts on existing agriculture.

Variations S2-B1 and S2-B2

Variation S2-B1 is part of the same route as the Applicant's Proposed Action Alternative. Variation S2-B1 has 0.1 more miles of moderate impacts than Variation S2-B2 due to crossing field crops (Link 2-35), all of which could be spanned. Compared to Variation S2-B2, Variation S2-B1 would require an estimated long-term disturbance of 1 more acre of field crops and construction disturbance of 2 more acres of field crops.

Variations S2-C1 and S2-C2

Variation S2-C1 is part of the same route as the Applicant's Proposed Action Alternative. Variation S2-1 has 0.1 more miles of moderate impacts than Variation S2-C2 due to crossing field crops (Link 2-45), all of which could be spanned. Compared to Variation S2-C2, Variation S2-C1 would require an estimated long-term disturbance of 1 more acre of field crops and construction disturbance of 2 more acres of field crops.

Variations S2-E1 and S2-E2

Variation S2-E1 is part of the same route as the Applicant's Proposed Action Alternative. Variation S2-E2 has 0.1 more miles of moderate impacts than Variation S2-E1 due to crossing field crops (Link 2-55), all of which could be spanned. Compared to Variation S2-E1, Variation S2-E2 would require an estimated long-term disturbance of 1 more acre of field crops and construction disturbance of 2 more acres of field crops.

Variations S2-F1 and S2-F2

Variation S2-F1 is part of the same route as the Applicant's Proposed Action Alternative. Variation S2-F1 has 0.4 more miles of moderate impacts than Variation S2-F2 due to crossing field crops (Links 2-75, 2-85), all of which could be spanned. Compared to Variation S2-F2, Variation S2-F1 would

require an estimated long-term disturbance of 3 more acres of field crops and construction disturbance of 9 more acres of field crops.

Glass Hill Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have 0.2 fewer miles of moderate impacts due to crossing field crops (Links 2-75, 2-85). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. These impacts would be mitigated using micro-siting, spanning, and coordination with the landowner. Long-term disturbance is estimated to be 2 fewer acres of field crops than the Applicant's Proposed Action Alternative. Construction disturbance is estimated to be 5 fewer acres of field crops than the Applicant's Proposed Action Alternative.

Variations S2-D1 and S2-D2

These route variations do not cross moderate or high impacts on existing agriculture.

Mill Creek Alternative

The Mill Creek Alternative would have the same impacts as the Applicant's Proposed Action Alternative. These impacts would generally occur on Links 2-12, 2-63, 2-70, and 2-80.

Conclusions

All alternative routes and variations in Segment 2 do not cross irrigated agriculture. The CropScape dataset does identify some grass/pasture and field crops being crossed by each alternative, with all alternatives similarly affecting existing agriculture in Segment 2.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

This section discloses impacts on important farmland, high-value soils, and CRP lands in Segment 2 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on important farmland and high-value soils are presented in Table 3-336 through Table 3-338. No CRP lands would be crossed by any alternative or route variation in Segment 2. Refer also to MV-17.

Table 3-336. Important Farmland and High-Value Soils in Segment 2—Blue Mountains (miles)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Applicant's Proposed Action	33.8	2.4	18.6	2.6
Variation S2-A1	*2.8*	*0.0*	*0.3*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.3*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*2.2*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*2.9*	*0.1*
Variation S2-C1	*9.3*	*0.0*	*7.8*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*6.5*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*1.5*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*1.4*	*0.0*

Table 3-336. Important Farmland and High-Value Soils in Segment 2—Blue Mountains (miles)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Variation S2-F1	*12.1*	*2.4*	*4.3*	*2.6*
Variation S2-F2	*12.2*	*1.5*	*3.0*	*1.8*
Glass Hill	33.7	2.4	18.1	2.6
Variation S2-D1	*4.3*	*0.0*	*3.5*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*3.3*	*0.0*
Mill Creek	34.0	1.6	15.3	2.4

Table Notes:
[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data
[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained
[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Table 3-337. Estimated Long-term Surface Disturbance of Important Farmland and High-Value Soils in Segment 2—Blue Mountains (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	33.8	17	134	19
Variation S2-A1	*2.8*	*0*	*2*	*0*
Variation S2-A2	*2.9*	*0*	*2*	*0*
Variation S2-B1	*3.7*	*0*	*17*	*0*
Variation S2-B2	*3.8*	*0*	*20*	*1*
Variation S2-C1	*9.3*	*0*	*65*	*0*
Variation S2-C2	*8.8*	*0*	*41*	*0*
Variation S2-E1	*2.3*	*0*	*11*	*0*
Variation S2-E2	*2.6*	*0*	*10*	*0*
Variation S2-F1	*12.1*	*15*	*26*	*16*
Variation S2-F2	*12.2*	*10*	*19*	*11*
Glass Hill	33.7	16	124	18
Variation S2-D1	*4.3*	*0*	*34*	*0*
Variation S2-D2	*4.1*	*0*	*28*	*0*
Mill Creek	34.0	12	117	18

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-338. Estimated Extent of Construction Disturbance of Important Farmland and High-Value Soils in Segment 2—Blue Mountains (acres)				
Alternative Route	**Total Length (miles)**	**Prime Farmland if Irrigated**	**Farmland of Statewide Importance**	**High-value Soils**
Applicant's Proposed Action	33.8	54	420	59
Variation S2-A1	*2.8*	*0*	*6*	*0*
Variation S2-A2	*2.9*	*0*	*6*	*0*
Variation S2-B1	*3.7*	*0*	*50*	*0*
Variation S2-B2	*3.8*	*0*	*65*	*2*
Variation S2-C1	*9.3*	*0*	*186*	*0*
Variation S2-C2	*8.8*	*0*	*141*	*0*
Variation S2-E1	*2.3*	*0*	*34*	*0*
Variation S2-E2	*2.6*	*0*	*31*	*0*
Variation S2-F1	*12.1*	*52*	*92*	*56*
Variation S2-F2	*12.2*	*33*	*65*	*39*
Glass Hill	33.7	54	404	58
Variation S2-D1	*4.3*	*0*	*89*	*0*
Variation S2-D2	*4.1*	*0*	*79*	*0*
Mill Creek	34.0	37	353	55

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Applicant's Proposed Action Alternative

This alternative route would require an estimated construction disturbance of 54 acres of prime farmland if irrigated, 420 acres of farmland of statewide importance, and 59 acres of high-value soils. This alternative route would require an estimated long-term disturbance of 17 acres of prime farmland if irrigated, 134 acres of farmland of statewide importance, and 19 acres of high-value soils. These impacts would occur generally on Links 2-5, 2-15, 2-20, 2-35, 2-45, 2-47, 2-50, 2-52, 2-60, 2-75, 2-85, and 2-95.

Variations S2-A1 and S2-A2

These variations would have the same disturbance. Impacts associated with Variation S2-A1 would occur on Link 2-5, and impacts associated with Variation S2-A2 would occur on Link 2-7.

Variations S2-B1 and S2-B2

Variation S2-B1 takes the same route as the Applicant's Proposed Action Alternative. Neither variation crosses prime farmland if irrigated. Variation S2-B1 would require an estimated construction disturbance of 15 fewer acres of farmland of statewide importance, and 2 fewer acres of high-value soils. Variation S2-B1 would require an estimated long-term disturbance of 3 fewer acres of farmland of statewide importance, and 1 fewer acre of high-value soils. Impacts associated with Variation S2-B1 would occur on Link 2-35, and impacts associated with Variation S2-B2 would occur on Link 2-25.

Variations S2-C1 and S2-C2

Variation S2-C1 takes the same route as the Applicant's Proposed Action Alternative. Neither variation crosses prime farmland if irrigated or high-value soils. Variation S2-C1 would require an estimated construction disturbance of 45 more acres of farmland of statewide importance and an estimated long-term disturbance of 24 more acres of farmland of statewide importance. Impacts associated with Variation S2-C1 would occur on Links 2-45, 2-47, and 2-50, and impacts associated with Variation S2-C2 would occur on Link 2-48.

Variations S2-E1 and S2-E2

Variation S2-E1 takes the same route as the Applicant's Proposed Action Alternative. Neither variation crosses prime farmland if irrigated or high-value soils. Variation S2- E2 would require an estimated construction disturbance of 3 fewer acre of farmland of statewide importance and an estimated long-term disturbance of 1 fewer acre of farmland of statewide importance. Impacts associated with Variation S2-E1 would occur on Link 2-60, and impacts associated with Variation S2-E2 would occur on Link 2-55.

Variations S2-F1 and S2-F2

Variation S2-F1 takes the same route as the Applicant's Proposed Action Alternative. Variation S2-F1 would require an estimated construction disturbance of 19 more acres of prime farmland if irrigated, 27 more acres of farmland of statewide importance, and 17 more acres of high-value soils. Variation S2-F1 would require an estimated long-term disturbance of 5 more acres of prime farmland if irrigated, 7 more acres of farmland of statewide importance, and 5 more acres of high-value soils. Impacts associated with Variation S2-F1 would occur on Links 2-75, 2-85, and 2-95, and impacts associated with Variation S2-F2 would occur on Links 2-70, 2-80, and 2-90.

Glass Hill Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have the same estimated construction disturbance of prime farmland if irrigated, 16 fewer acres of farmland of statewide importance, and 1 fewer acre of high-value soils. This alternative route would require an estimated long-term disturbance of 1 fewer acre of prime farmland if irrigated, 10 fewer acres of farmland of statewide importance, and 1 fewer acre of high-value soils. These impacts would occur generally on Links 2-5, 2-15, 2-20, 2-40, 2-42, 2-47, 2-50, 2-52, 2-60, 2-75, 2-85, and 2-95.

Variations S2-D1 and S2-D2

Variation S2-D1 takes the same route as the Applicant's Proposed Action Alternative. Neither variation crosses prime farmland if irrigated or high-value soils. Variation S2-D1 would require an estimated construction disturbance of 10 more acres of farmland of statewide importance and an estimated long-term disturbance of 6 more acres of farmland of statewide importance. Impacts associated with Variation S2-D1 would occur on Links 2-42 and 2-47, and impacts associated with Variation S2-F2 would occur on Link 2-46.

Mill Creek Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 17 fewer acres of prime farmland if irrigated, 67 fewer acres of farmland of statewide importance, and 4 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 5 fewer acres of prime farmland if irrigated, 17 fewer acres of farmland of statewide importance, and 1 fewer acre of high-value soils. This alternative route would have the least impacts on important farmland in Segment 2. These impacts would occur generally on Links 2-7, 2-10, 2-12, 2-63, 2-70, 2-80, and 2-90.

Conclusions

In Segment 2, the Applicant's Proposed Action Alternative and the Glass Hill Alternative would have similar impacts on important farmland and high-value soils, while the Mill Creek Alternative would have the least impacts. No CRP acres would be crossed by the B2H Project in this segment.

Livestock Grazing

This section discloses impacts on livestock grazing in Segment 2 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on livestock grazing are presented in Table 3-339. The data used to generate these results are displayed on MV-18. Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Estimated affected AUMs are based off of long-term disturbance on federal grazing allotments. Long-term impacts on AUMs would occur throughout all allotments crossed by a particular segment.

Table 3-339. Estimated Extent of Disturbance of Grazing Allotments in Segment 2—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Applicant's Proposed Action	33.8	11.5	68,620	68,378	2,396	260	83	1
Variation S2-A1	*2.8*	*1.3*	*22,111*	*22,111*	*2,275*	*27*	*7*	<1
Variation S2-A2	*2.9*	*2.5*	*22,111*	*22,111*	*2,275*	*52*	*13*	*1*
Variation S2-B1	*3.7*	*0.8*	*2,401*	*2,401*	*22*	*18*	*6*	<1
Variation S2-B2	*3.8*	*0.0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*9.3*	*2.0*	*11,097*	*10,855*	*34*	*48*	*17*	*0*
Variation S2-C2	*8.8*	*2.9*	*11,097*	*11,097*	*34*	*63*	*18*	*0*
Variation S2-E1	*2.3*	*0.9*	*4,557*	*4,557*	*12*	*20*	*7*	*0*
Variation S2-E2	*2.6*	*1.4*	*4,557*	*4,557*	*12*	*31*	*10*	*0*
Variation S2-F1	*12.1*	*4.4*	*33,012*	*33,012*	*65*	*95*	*27*	*0*
Variation S2-F2	*12.2*	*5.7*	*33,012*	*33,012*	*65*	*124*	*36*	*0*

Table 3-339. Estimated Extent of Disturbance of Grazing Allotments in Segment 2—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Glass Hill	33.7	12.4	68,620	68,378	2,396	277	85	1
Variation S2-D1	*4.3*	*0.0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*4.1*	*0.0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	34.0	9.8	55,123	55,123	2,340	226	75	2

Table Notes:
[1]Data source is U.S. Forest Service and Bureau of Land Management grazing allotments datasets.
[2]Allotment miles crossed by the B2H Project 250-foot right-of-way.
[3]Active animal unit months of allotments crossed by the B2H Project centerline.
[4]Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction and long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing, including estimated AUMs affected. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description. Actual AUMs affected would be calculated and addressed during the permit renewal process.

Applicant's Proposed Action Alternative

As presented in Table 3-339, this alternative route crosses 11.5 miles of allotments (Links 2-1, 2-5, 2-30, 2-35, 2-50, 2-52, 2-60, 2-75, 2-85, 2-95). An estimated 83 acres of long-term surface disturbance and 260 acres of construction disturbance would be expected. Construction disturbance would affect less than 1 percent of the surface area of the allotments, which is expected to affect 1 AUM of the long-term forage available to livestock in the allotments.

Variations S2-A1 and S2-A2

Variation S2-A1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 1.2 fewer miles of allotments than Variation S2-A2, resulting in an estimated 6 fewer acres of long-term surface disturbance and 25 fewer acres of construction disturbance. Variation S2-A2 is expected to reduce long-term forage available to livestock by 1 AUM, while Variation S2-A1 would affect slightly less AUMs. Impacts for Variation S2-A1 would occur on Links 2-1 and 2-5, and impacts for Variation S2-A2 would occur on Links 2-3 and 2-7.

Variations S2-B1 and S2-B2

Variation S2-B1 shares the same alignment as the Applicant's Proposed Action Alternative. This route variation crosses 0.8 more miles of allotments (Links 2-30 and 2-35) than Variation S2-B2, which crosses no allotments. This would result in an estimated 6 more acres of long-term surface disturbance and 18 more acres of construction disturbance. Variation S2-B1 is expected to reduce long-term forage available to livestock by slightly more AUMs than S2-B2.

Variations S2-C1 and S2-C2

Variation S2-C1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 0.9 fewer miles of allotments resulting in an estimated 1 fewer acre of long-term surface disturbance and 15 fewer acres of construction disturbance than Variation S2-C2. Impacts for Variation S2-C1 would occur on Link 2-50, and impacts for Variation S2-C2 would occur on Link 2-48.

Variations S2-E1 and S2-E2

Variation S2-E1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 0.9 fewer miles of allotments resulting in an estimated 3 fewer acre of long-term surface disturbance and 11 fewer acres of construction disturbance than Variation S2-E2. Impacts for Variation S2-E1 would occur on Link 2-60, and impacts for Variation S2-E2 would occur on Links 2-55 and 2-65.

Variations S2-F1 and S2-F2

Variation S2-F1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 1.3 fewer miles of allotments resulting in an estimated 9 fewer acres of long-term surface disturbance and 29 fewer acres of construction disturbance than S2-F2. Impacts for Variation S2-F1 would occur on Links 2-75, 2-85, and 2-95, and impacts for Variation S2-F2 would occur on Links 2-70, 2-80, and 2-90.

Glass Hill Alternative

Compared to the Applicant's Proposed Action Alternative, the Glass Hill Alternative crosses 0.9 more miles of allotments resulting in an estimated 2 more acres of long-term disturbance and 17 more acres of construction disturbance. Area of vegetation clearing would affect less than 1 percent of the surface area of the allotments, which is expected to reduce the forage available to livestock in the allotments by 1 AUM (the same as the Applicant's Proposed Action). These impacts would occur generally on Links 2-1, 2-5, 2-30, 2-40, 2-50, 2-52, 2-60, 2-75, 2-85, and 2-95.

Variations S2-D1 and S2-D2

These route variations do not cross grazing allotments.

Mill Creek Alternative

Compared to the Applicant's Proposed Action Alternative, the Mill Creek Alternative crosses 1.7 fewer miles of allotments resulting in an estimated 8 fewer acres of long-term disturbance and 34 fewer acres of construction disturbance. Construction disturbance would affect less than 1 percent of the surface area of the allotments, which is expected to affect 1 AUM more than the Applicant's Proposed Action Alternative. This alternative route would have the least disturbance on livestock grazing allotments in Segment 2, but would affect the most AUMs. These impacts would occur generally on Links 2-3, 2-7, 2-63, 2-65, 2-70, 2-80, and 2-90.

Conclusions

Impacts on grazing allotments would be similar for all alternative routes; however, the Mill Creek Alternative would result in 10 fewer acres of long-term surface disturbance within grazing allotments than any other alternative. Variation S2-A2 would result in long-term impacts on 1 AUM while other

route variations would affect less than 1 AUM. The Millcreek Alternative would affect the most federal grazing allotment AUMs.

SEGMENT 3—BAKER VALLEY

Existing Agriculture

This section discloses impacts on existing agriculture in Segment 3 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on existing agriculture are presented in Table 3-340. The data used to generate these results are displayed on MV-16.

Table 3-341 presents the estimated long-term surface disturbance associated with each alternative and route variation. Table 3-342 presents estimated construction disturbance for the alternatives and route variations in Segment 3.

Aerial and ground application of pesticides, in addition to aerial seeding could occur on any cultivated farmland in Segment 3. Impacts include obstruction of flight paths from the tower structures and conductors. There could be increased safety risks to operators navigating around tower structures and conductors. There also could be interruptions in spraying schedules as a result of construction activities, but the Applicant would coordinate with landowners to reduce these impacts. No data are available for a comparison of alternatives and route variations.

Applicant's Proposed Action

This alternative has 1.0 mile of moderate and high impacts due to crossing irrigated farmland (Links 3-22, 3-58, 3-80, 3-82) and field crops (Links 3-4, 3-22, 3-58, 3-80, 3-82, 3-92). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. They would be mitigated using micro-siting and coordination with the landowner. The Applicant's Proposed Action Alternative crosses 0.3 mile of pivot irrigation, all of which could be spanned. Long-term disturbance is estimated to be 6 acres of irrigated farmland and 6 acres of field crops. Construction disturbance is estimated to be 18 acres of irrigated farmland and 18 acres of field crops.

Variations S3-A1 and S3-A2

Variation S3-A1 is part of the same route as the Applicant's Proposed Action Alternative. Variation S3-A1 has 0.3 more miles of moderate impacts than Variation S3-A2 due to crossing pivot irrigation (Link 3-22), all of which could be spanned. Compared to Variation S3-A2, Variation S3-A1 would require an estimated long-term disturbance of 2 more acres of irrigated farmland and 1 more acre of field crops. Variation S3-A1 would require an estimated construction disturbance of 6 more acres of irrigated farmland and 4 more acres of field crops.

Table 3-340. Inventory Data and Residual Impacts for Crop Types and Irrigated Farmland in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Irrigation Type (miles crossed)				Crop Type or Confined Animal Feeding Operation (miles crossed)							Overall Residual Impacts (miles crossed)		
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Fallow/Idle Cropland[2]	Field Crops[2]	Fruit and Tree Nuts[2]	Grass/Pasture[2]	Vegetables[2]	Tree Farms[3]	Confined Animal Feeding Operation[4]	Low	Moderate	High
Applicant's Proposed Action	55.2	0.0	0.3	0.2	0.3	0.0	0.8	0.0	2.5	0.0	0.0	0.0	2.5	0.7	0.3
Variation S3-A1	*12.4*	*0.0*	*0.3*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.3*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*0.0*	*0.2*	*0.0*	*0.1*	*0.0*	*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*0.2*
Variation S3-B3	*14.7*	*0.0*	*0.2*	*0.0*	*0.1*	*0.0*	*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.6*	*0.2*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.0*	*1.3*	*0.0*	*1.5*	*0.0*	*0.3*	*0.1*	*0.0*	*0.0*	*0.2*	*1.8*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.2*	*0.0*	*1.2*	*0.2*	*1.2*	*0.0*	*0.5*	*0.1*	*0.0*	*0.0*	*0.2*	*1.6*	*0.2*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.2*	*0.3*	*0.0*	*0.5*	*0.0*	*2.1*	*0.0*	*0.0*	*0.0*	*2.1*	*0.6*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.6*	*0.0*	*2.4*	*0.0*	*0.0*	*0.0*	*2.4*	*0.6*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.3*	*0.0*	*0.0*	*0.5*	*0.0*	*1.2*	*0.0*	*0.0*	*0.0*	*1.2*	*0.5*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.3*	*0.0*	*1.2*	*0.0*	*0.0*	*0.0*	*1.2*	*0.3*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.1*	*0.0*	*1.6*	*0.0*	*0.0*	*0.0*	*1.6*	*0.1*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.3*	*0.0*	*0.0*	*0.2*	*0.0*	*0.6*	*0.0*	*0.0*	*0.0*	*0.6*	*0.3*	*0.0*
Flagstaff A	55.3	0.0	0.5	0.2	1.5	0.2	2.0	0.0	2.9	0.1	0.0	0.0	2.6	2.3	0.5
Timber Canyon	70.3	0.0	0.0	1.4	0.2	0.0	2.1	0.0	0.9	0.0	0.0	0.0	1.6	2.3	0.0
Flagstaff A – Burnt River Mountain	55.3	0.0	0.5	0.3	1.2	0.2	2.0	0.0	2.0	0.1	0.0	0.0	1.7	2.2	0.5
Flagstaff B	56.0	0.0	0.5	0.2	0.4	0.0	1.4	0.0	2.4	0.0	0.0	0.0	2.4	1.3	0.5

Table 3-340. Inventory Data and Residual Impacts for Crop Types and Irrigated Farmland in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Irrigation Type (miles crossed)				Crop Type or Confined Animal Feeding Operation (miles crossed)							Overall Residual Impacts (miles crossed)		
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Fallow/Idle Cropland[2]	Field Crops[2]	Fruit and Tree Nuts[2]	Grass/Pasture[2]	Vegetables[2]	Tree Farms[3]	Confined Animal Feeding Operation[4]	Low	Moderate	High
Flagstaff B – Burnt River West	55.7	0.0	0.2	0.1	0.1	0.0	0.8	0.0	1.9	0.0	0.0	0.0	1.9	0.8	0.2
Flagstaff B – Durkee	59.6	0.0	0.5	0.3	1.2	0.2	2.0	0.0	2.0	0.1	0.0	0.0	1.7	2.2	0.5

Table Notes:

[1]Data source includes cultivated farmland as seen in aerial imagery and classified as dryland or as an irrigation type. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[2]Data source includes U.S. Department of Agriculture CropScape. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[3]Data source is Boardman Tree Farm digitized from aerial imagery. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[4]Data source is Oregon Department of Agriculture confined animal feeding operations and self-reported dairies. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

Table 3-341. Estimated Long-Term Surface Disturbance of Crop Land and Irrigated Farmland in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Estimated Disturbance in Irrigated Farmland (acres)					Estimated Disturbance by Crop Type or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	55.2	0	2	1	2	6	0	6	0	18	0	0	0.0	23
Variation S3-A1	*12.4*	*0*	*2*	*0*	*0*	*2*	*0*	*2*	*0*	*1*	*0*	*0*	*0.0*	*2*
Variation S3-A2	*12.2*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*1*	*0*	*0*	*0.0*	*1*
Variation S3-B1	*13.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0.0*	*1*
Variation S3-B2	*14.4*	*0*	*1*	*0*	*1*	*2*	*0*	*4*	*0*	*0*	*0*	*0*	*0.0*	*4*
Variation S3-B3	*14.7*	*0*	*1*	*0*	*1*	*2*	*0*	*3*	*0*	*0*	*0*	*0*	*0.0*	*3*
Variation S3-B4	*14.3*	*0*	*0*	*0*	*7*	*7*	*0*	*8*	*0*	*2*	*1*	*0*	*0.0*	*10*
Variation S3-B5	*14.0*	*0*	*1*	*0*	*7*	*9*	*1*	*7*	*0*	*3*	*1*	*0*	*0.0*	*12*
Variation S3-C1	*21.1*	*0*	*0*	*2*	*3*	*4*	*0*	*4*	*0*	*18*	*0*	*0*	*0.0*	*22*
Variation S3-C2	*21.7*	*0*	*0*	*2*	*0*	*2*	*0*	*5*	*0*	*20*	*0*	*0*	*0.0*	*25*
Variation S3-C3	*21.1*	*0*	*0*	*3*	*0*	*3*	*0*	*5*	*0*	*11*	*0*	*0*	*0.0*	*15*
Variation S3-C4	*21.4*	*0*	*0*	*1*	*0*	*1*	*0*	*3*	*0*	*11*	*0*	*0*	*0.0*	*14*
Variation S3-C5	*21.0*	*0*	*0*	*1*	*0*	*1*	*0*	*1*	*0*	*19*	*0*	*0*	*0.0*	*20*
Variation S3-C6	*24.7*	*0*	*0*	*4*	*0*	*4*	*0*	*2*	*0*	*7*	*0*	*0*	*0.0*	*10*
Flagstaff A	55.3	0	3	1	10	15	1	14	0	20	1	0	0.0	35
Timber Canyon	70.3	0	0	12	2	14	0	18	0	14	0	0	0.0	32
Flagstaff A – Burnt River Mountain	55.3	0	4	2	8	14	1	14	0	14	1	0	0.0	30

Table 3-341. Estimated Long-Term Surface Disturbance of Crop Land and Irrigated Farmland in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Estimated Disturbance in Irrigated Farmland (acres)					Estimated Disturbance by Crop Type or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Flagstaff B	56.0	0	3	1	3	7	0	9	0	16	0	0	0.0	25
Flagstaff B – Burnt River West	55.7	0	2	1	1	3	0	6	0	15	0	0	0.0	22
Flagstaff B - Durkee	59.6	0	4	3	1	8	0	9	0	8	0	0	0.0	17

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-342. Estimated Extent of Construction Disturbance of Crop Land and Irrigated Farmland in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Estimated Construction Disturbance in Irrigated Farmland (acres)					Estimated Construction Disturbance of Crop Types or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/ Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	55.2	0	7	4	7	18	0	18	0	56	0	0	0	74
Variation S3-A1	*12.4*	*0*	*6*	*0*	*0*	*6*	*0*	*6*	*0*	*2*	*0*	*0*	*0*	*8*
Variation S3-A2	*12.2*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*2*	*0*	*0*	*0*	*4*
Variation S3-B1	*13.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*2*
Variation S3-B2	*14.4*	*0*	*4*	*0*	*2*	*7*	*0*	*13*	*0*	*0*	*0*	*0*	*0*	*13*
Variation S3-B3	*14.7*	*0*	*4*	*0*	*2*	*6*	*0*	*13*	*0*	*0*	*0*	*0*	*0*	*13*
Variation S3-B4	*14.3*	*0*	*0*	*0*	*27*	*27*	*0*	*31*	*0*	*6*	*2*	*0*	*0*	*40*
Variation S3-B5	*14.0*	*0*	*4*	*0*	*26*	*30*	*4*	*26*	*0*	*11*	*2*	*0*	*0*	*43*
Variation S3-C1	*21.1*	*0*	*0*	*5*	*7*	*12*	*0*	*12*	*0*	*50*	*0*	*0*	*0*	*62*
Variation S3-C2	*21.7*	*0*	*0*	*5*	*0*	*5*	*0*	*14*	*0*	*57*	*0*	*0*	*0*	*71*
Variation S3-C3	*21.1*	*0*	*0*	*7*	*0*	*7*	*0*	*12*	*0*	*29*	*0*	*0*	*0*	*41*
Variation S3-C4	*21.4*	*0*	*0*	*2*	*0*	*2*	*0*	*7*	*0*	*29*	*0*	*0*	*0*	*37*
Variation S3-C5	*21.0*	*0*	*0*	*3*	*0*	*3*	*0*	*3*	*0*	*44*	*0*	*0*	*0*	*47*
Variation S3-C6	*24.7*	*0*	*0*	*8*	*0*	*8*	*0*	*6*	*0*	*17*	*0*	*0*	*0*	*22*
Flagstaff A	55.3	0	11	4	33	48	4	44	0	64	2	0	0	115
Timber Canyon	70.3	0	0	34	5	39	0	50	0	38	0	0	0	89
Flagstaff A – Burnt River Mountain	55.3	0	11	7	27	45	4	45	0	45	2	0	0	96
Flagstaff B	56.0	0	11	4	9	24	0	31	0	53	0	0	0	84

Table 3-342. Estimated Extent of Construction Disturbance of Crop Land and Irrigated Farmland in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Estimated Construction Disturbance in Irrigated Farmland (acres)					Estimated Construction Disturbance of Crop Types or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/ Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Flagstaff B – Burnt River West	55.7	0	5	2	2	9	0	19	0	44	0	0	0	63
Flagstaff B – Durkee	59.6	0	12	7	2	22	0	26	0	22	0	0	0	48

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Variations S3-B1 through S3-B5

Variation S3-B1 is part of the same route as the Applicant's Proposed Action Alternative. Out of these route variations, Variation S3-B1 is the only that has no high or moderate impacts. Variation S3-B5 would have the highest impacts and compared to S3-B1 would require an estimated long-term disturbance of 9 more acres of irrigated farmland (Links 3-34, 3-36, 3-40) and 7 more acres of field crops (Links 3-24, 3-34, 3-39, 3-40). Compared to Variation S3-B1, Variation S3-B5 would require an estimated construction disturbance of 30 more acres of irrigated farmland and 26 more acres of field crops.

Variations S3-C1 through S3-C6

Variation S3-C1 is part of the same route as the Applicant's Proposed Action Alternative. Out of these route variations, Variation S3-C5 would have the lowest impacts. Variation S3-C1 and Variation S3-C2 would have the highest impacts. Compared to S3-C1, Variation S3-C5 would require an estimated long-term disturbance of 3 fewer acres of irrigated farmland (Link 3-60) and 3 fewer acres of field crops (Link 3-60). It would require an estimated construction disturbance of 9 fewer acres of irrigated farmland and 6 fewer acres of field crops.

Flagstaff A Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have an additional 1.8 miles of moderate and high impacts due to crossing irrigated agriculture (Links 3-22, 3-34, 3-36, 3-40, 3-58, 3-80, 3-82), vegetable operations (Link 3-36), and field crops (Links 3-4, 3-22, 3-34, 3-34, 3-39, 3-40, 3-58, 3-80, 3-82, 3-92). Impacts on field crops and vegetables include long-term removal of crops from production and temporary interruption of planting schedules. Impacts on irrigation include long-term interference with irrigation infrastructure and temporary interruption of irrigation schedules. These impacts would be mitigated using micro-siting, spanning, and coordination with the landowner. Long-term disturbance is estimated to be an additional 9 acres of irrigated agriculture and 9 acres of vegetables and field crops. Construction disturbance is estimated to be an additional 30 acres of irrigated farmland and 28 acres of field crops and vegetables.

This alternative route would have the highest impacts on existing agriculture of any alternative in Segment 3.

Timber Canyon Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have 0.5 mile less of high impacts, but 1.6 miles more of moderate impacts due to crossing irrigated agriculture (Links 3-8, 3-80, 3-82) and field crops (Links 3-6, 3-8, 3-80, 3-82). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. Impacts on irrigation include long-term interference with irrigation infrastructure and temporary interruption of irrigation schedules. These impacts would be mitigated using micro-siting, spanning, and coordination with the landowner. Long-term disturbance is estimated to be an additional 8 acres of irrigated agriculture and 12 acres of field crops. Construction disturbance is estimated to be an additional 21 acres irrigated farmland and 32 acres of field crops.

Flagstaff A – Burnt River Mountain Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have an additional 1.7 miles of moderate and high impacts due to crossing irrigated agriculture (3-22, 3-34, 3-36, 3-40, 3-60, 3-64), vegetable operations (Link 3-36), and field crops (Links 3-4, 3-22, 3-24, 3-34, 3-39, 3-40, 3-60, 3-64, 3-72, 3-92). Impacts on field crops and vegetables include long-term removal of crops from production and temporary interruption of planting schedules. Impacts on irrigation include long-term interference with irrigation infrastructure and temporary interruption of irrigation schedules. These impacts would be mitigated using micro-siting, spanning, and coordination with the landowner. Long-term disturbance is estimated to be an additional 8 acres of irrigated agriculture and 9 acres of vegetables and field crops. Construction disturbance is estimated to be an additional 27 acres of irrigated farmland and 29 acres of field crops and vegetables.

Flagstaff B Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have an additional 0.8 mile of moderate and high impacts due to crossing irrigated agriculture (3-22, 3-37, 3-41, 3-58, 3-80, 3-82) and field crops (Links 3-4, 3-22, 3-24, 3-37, 3-41, 3-58, 3-80, 3-82, 3-92). Impacts on field crops and irrigation would be similar to those discussed for the Flagstaff A – Burnt River Mountain Alternative, except long-term disturbance is estimated to be an additional 1 acre of irrigated agriculture and 3 acres of field crops. Construction disturbance is estimated to be an additional 6 acres irrigated farmland and 13 acres of field crops.

Flagstaff B – Burnt River West Alternative

Compared to the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative would have the same miles of moderate and high impacts due to crossing irrigated agriculture (Links 3-37, 3-41, 3-60) and field crops (Links 3-12, 3-24, 3-37, 3-41, 3-60). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. Impacts on field crops and irrigation would be similar to those discussed for the Flagstaff A – Burnt River Mountain Alternative. Long-term disturbance is estimated to be 3 fewer acres of irrigated agriculture and the same acres of field crops. Construction disturbance is estimated to be 9 fewer acres of irrigated farmland and 1 more acre of field crops. This alternative route would have the least impacts of all alternative routes in Segment 3.

Flagstaff B – Durkee

Compared to the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative would have an additional 1.7 miles of moderate and high impacts due to crossing irrigated agriculture (Links 3-22, 3-37, 3-41, 3-60, 3-90) and field crops (Links 3-4, 3-22, 3-24, 3-37, 3-41, 3-60, 3-90). Impacts on field crops and irrigation would be similar to those discussed for the Flagstaff A – Burnt River Mountain Alternative, except long-term disturbance is estimated to be an additional 2 acres of irrigated agriculture and 3 acres of field crops. Construction disturbance is estimated to be an additional 4 acres of irrigated farmland and 8 acres of field crops.

Conclusions

All alternatives in Segment 3 would affect existing agriculture, though the Applicant's Proposed Action and Flagstaff B – Burnt River West alternatives would have the least impacts on existing agriculture in Segment 3. The Applicant's Proposed Action takes an easterly route through the Baker area, avoiding much of the existing irrigated agriculture that some of the other alternatives cross (such as the Flagstaff A and Flagstaff A – Burnt River Mountain alternatives). The Timber Canyon Alternative would avoid the agriculture in Baker Valley; however, it crosses existing irrigated agriculture near Richland. The Flagstaff B Alternative, though it does not avoid existing agriculture as well as the Applicant's Proposed Action Alternative, would have much less impacts on existing agriculture than the Timber Canyon, Flagstaff A and Flagstaff A - Burnt River Mountain Alternatives. Through the Durkee area, the Flagstaff B – Durkee Alternative avoids existing agriculture that the Applicant's Proposed Action Alternative crosses. Thus, a combination of the Applicant's Proposed Action Alternative and the Flagstaff B – Durkee Alternative would have the least impacts on existing agriculture in Segment 3.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

This section discloses impacts on important farmland, high-value soils, and CRP lands in Segment 3 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on important farmland, high-value soils, and CRP lands are presented in Table 3-343 through Table 3-345. Refer also to MV-17.

Table 3-343. Important Farmland and High-Value Soils in Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Applicant's Proposed Action	55.2	4.3	36.9	4.6
Variation S3-A1	*12.4*	*0.0*	*6.4*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*3.2*	*0.0*
Variation S3-B1	*13.9*	*2.3*	*8.3*	*2.5*
Variation S3-B2	*14.4*	*1.6*	*8.6*	*2.0*
Variation S3-B3	*14.7*	*1.6*	*9.2*	*2.0*
Variation S3-B4	*14.3*	*2.7*	*8.7*	*3.0*
Variation S3-B5	*14.0*	*2.9*	*7.7*	*2.9*
Variation S3-C1	*21.1*	*2.0*	*15.3*	*2.1*
Variation S3-C2	*21.7*	*1.9*	*15.9*	*2.1*
Variation S3-C3	*21.1*	*2.1*	*11.8*	*2.4*
Variation S3-C4	*21.4*	*2.0*	*12.4*	*2.2*
Variation S3-C5	*21.0*	*0.5*	*11.5*	*0.5*
Variation S3-C6	*24.7*	*0.6*	*18.4*	*0.7*
Flagstaff A	55.3	4.9	36.3	5.0
Timber Canyon	70.3	2.3	32.0	2.9
Flagstaff A – Burnt River Mountain	55.3	5.0	32.8	5.3

Table 3-343. Important Farmland and High-Value Soils in Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Flagstaff B	56.0	3.6	37.8	4.1
Flagstaff B – Burnt River West	55.7	2.1	30.8	2.5
Flagstaff B – Durkee	59.6	2.2	40.9	2.7

Table Notes:
[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data
[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained
[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Table 3-344. Estimated Long-Term Surface Disturbance of Important Farmland and High-Value Soils in Segment 3—Baker Valley (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	55.2	30	258	32
Variation S3-A1	*12.4*	*0*	*35*	*0*
Variation S3-A2	*12.2*	*0*	*17*	*0*
Variation S3-B1	*13.9*	*16*	*58*	*17*
Variation S3-B2	*14.4*	*10*	*55*	*13*
Variation S3-B3	*14.7*	*9*	*53*	*12*
Variation S3-B4	*14.3*	*15*	*48*	*17*
Variation S3-B5	*14.0*	*18*	*47*	*18*
Variation S3-C1	*21.1*	*17*	*128*	*18*
Variation S3-C2	*21.7*	*16*	*130*	*17*
Variation S3-C3	*21.1*	*19*	*106*	*22*
Variation S3-C4	*21.4*	*18*	*112*	*20*
Variation S3-C5	*21.0*	*6*	*138*	*6*
Variation S3-C6	*24.7*	*7*	*227*	*9*
Flagstaff A	55.3	33	246	34
Timber Canyon	70.3	20	276	25
Flagstaff A – Burnt River Mountain	55.3	35	230	37
Flagstaff B	56.0	24	253	27
Flagstaff B – Burnt River West	55.7	17	246	20
Flagstaff B – Durkee	59.6	19	345	23

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-345. Estimated Extent of Construction Disturbance of Important Farmland and High-Value Soils in Segment 3-Baker Valley (acres)				
Alternative Route	**Total Length (miles)**	**Prime Farmland if Irrigated**	**Farmland of Statewide Importance**	**High-value Soils**
Applicant's Proposed Action	55.2	96	827	103
Variation S3-A1	*12.4*	*0*	*134*	*0*
Variation S3-A2	*12.2*	*0*	*66*	*0*
Variation S3-B1	*13.9*	*52*	*186*	*56*
Variation S3-B2	*14.4*	*35*	*188*	*44*
Variation S3-B3	*14.7*	*34*	*195*	*42*
Variation S3-B4	*14.3*	*57*	*182*	*63*
Variation S3-B5	*14.0*	*62*	*166*	*62*
Variation S3-C1	*21.1*	*48*	*364*	*50*
Variation S3-C2	*21.7*	*45*	*375*	*50*
Variation S3-C3	*21.1*	*51*	*288*	*59*
Variation S3-C4	*21.4*	*49*	*303*	*54*
Variation S3-C5	*21.0*	*14*	*315*	*14*
Variation S3-C6	*24.7*	*17*	*511*	*19*
Flagstaff A	55.3	109	806	111
Timber Canyon	70.3	55	770	70
Flagstaff A – Burnt River Mountain	55.3	112	736	119
Flagstaff B	56.0	80	836	91
Flagstaff B – Burnt River West	55.7	49	721	59
Flagstaff B – Durkee	59.6	52	976	64

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-346 presents the extent of CRP lands that would be crossed by the right-of-way of the B2H Project.

Table 3-346. Conservation Reserve Program Lands Crossed by the Right-of-Way in Segment 3—Baker Valley		
Alternative Route	**Total Length (miles)**	**Lands Enrolled in Conservation Reserve Programs (acres)**
Applicant's Proposed Action	55.2	2
Variation S3-A1	*12.4*	*0*
Variation S3-A2	*12.2*	*0*
Variation S3-B1	*13.9*	*0*
Variation S3-B2	*14.4*	*0*
Variation S3-B3	*14.7*	*0*
Variation S3-B4	*14.3*	*0*
Variation S3-B5	*14.0*	*0*

Table 3-346. Conservation Reserve Program Lands Crossed by the Right-of-Way in Segment 3—Baker Valley		
Alternative Route	**Total Length (miles)**	**Lands Enrolled in Conservation Reserve Programs (acres)**
Variation S3-C1	*21.1*	*2*
Variation S3-C2	*21.7*	*6*
Variation S3-C3	*21.1*	*19*
Variation S3-C4	*21.4*	*10*
Variation S3-C5	*21.0*	*7*
Variation S3-C6	*24.7*	*5*
Flagstaff A	55.3	2
Timber Canyon	70.3	12
Flagstaff A – Burnt River Mountain	55.3	19
Flagstaff B	56.0	2
Flagstaff B – Burnt River West	55.7	7
Flagstaff B – Durkee	59.6	5
Table Note: The Farm Service Agency estimated the number of acres of CRP lands crossed by the B2H Project 250-foot right-of-way. CRP acres may be slightly over-reported. Acres have been rounded to the nearest whole number.		

Applicant's Proposed Action Alternative

This alternative route would require an estimated construction disturbance of 96 acres of prime farmland if irrigated, 827 acres of farmland of statewide importance, and 103 acres of high-value soils. This alternative route would require an estimated long-term disturbance of 30 acres of prime farmland if irrigated, 258 acres of farmland of statewide importance, and 32 acres of high-value soils. These impacts would occur generally on Links 3-4, 3-22, 3-26, 3-28, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, and 3-92. Vegetation clearing would increase the potential for soil loss due to erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

In Segment 3, this alternative route crosses the least land (2 acres) enrolled in CRPs (although the same extent as Flagstaff A and Flagstaff B Alternatives). Where construction disturbance occurs, it would be reclaimed and the CRP lands would remain under contract. However, acreages of footprints for permanent B2H Project facilities would be calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Variations S3-A1 and S3-A2

Variation S3-A1 takes the same route as the Applicant's Proposed Action Alternative. Compared to Variation S3-A2, this route variation would require an estimated construction disturbance of 68 more acres of farmland of statewide importance and an estimated long-term disturbance of 18 more acres of farmland of statewide importance. Impacts associated with S3-A1 would occur on Links 3-4 and 3-22, and impacts associated with S3-A2 would occur on Links 3-10 and 3-12.

Variations S3-B1 through S3-B5

Variation S3-B1 takes the same route as the Applicant's Proposed Action Alternative. Variation S3-B3 would have the least impact on prime farmland if irrigated and high-value soils. Variation S3-B4 would have the highest impact on high-value soils requiring 63 acres of construction disturbance and 17 acres of long-term surface disturbance of high-value soils. Variation S3-B5 would have the highest impacts of any of these route variations on prime farmland if irrigated, requiring an estimated 10 more acres of construction disturbance and 2 more acres of long-term surface disturbance than Variation S3-B1. Impacts associated with S3-B1 would occur on Links 3-26 and 3-28. Impacts associated with S3-B2 would occur on Links 3-24, 3-31, 3-37, 3-41, 3-46, 3-47, and 3-48. Impacts associated with S3-B3 would occur on Links 3-24, 3-31, 3-37, 3-41, 3-44, 3-45, 3-46, and 3-48. Impacts associated with S3-B4 would occur on Links 3-24, 3-31, 3-32, 3-36, 3-38, 3-39, 3-43, 3-44, and 3-48. Impacts associated with S3-B5 would occur on Links 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, and 3-48.

Variations S3-C1 through Variation S3-C6

Variation S3-C1 takes the same route as the Applicant's Proposed Action Alternative. Variation S3-C5 would have the least impacts on prime farmland if irrigated, requiring an estimated 34 fewer acres of construction disturbance and 11 fewer acres of long-term surface disturbance of prime farmland if irrigated than Variation S3-C1. It would require an estimated 36 fewer acres of construction disturbance and 12 fewer acres of long-term surface disturbance of high-value soils than Variation S3-C1. Variation S3-C3 would have the least impacts on farmland of statewide importance requiring 76 fewer acres of construction disturbance and 22 fewer acres of long-term surface disturbance than Variation S3-C1. Impacts associated with S3-C1 would occur on Links 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, and 3-92. Impacts associated with S3-C2 would occur on Links 3-42, 3-78, 3-80, 3-82, 3-86, 3-88, and 3-92. Impacts associated with S3-C3 would occur on Links 3-60, 3-62, 3-64, 3-72, 3-76, 3-88, and 3-92. Impacts associated with S3-C4 would occur on Links 3-60, 3-62, 3-68, 3-70, 3-72, 3-76, 3-88, and 3-92. Impacts associated with S3-C5 would occur on Links 3-60, 3-62, 3-66, 3-71, 3-73, and 3-94. Impacts associated with S3-C6 would occur on Links 3-60, 3-74, 3-90, and 3-94.

Variation S3-C1 crosses the least CRP lands and Variation S3-C6 crosses the most CRP lands.

Flagstaff A Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 13 more acres of prime farmland if irrigated, 21 fewer acres of farmland of statewide importance, and 8 more acres of high-value soils. This alternative route would require an estimated long-term disturbance of 3 more acres of prime farmland if irrigated, 12 fewer acres of farmland of statewide importance, and 2 more acres of high-value soils. These impacts would occur generally on Links 3-4, 3-22, 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, and 3-92.

This alternative route crosses the same amount of CRP lands as the Applicant's Proposed Action Alternative. Where construction disturbance occurs would be reclaimed and the CRP lands would remain under contract. However, acreages of footprints for permanent B2H Project facilities would be

calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Timber Canyon Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 41 fewer acres of prime farmland if irrigated, 57 fewer acres of farmland of statewide importance, and 33 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 10 fewer acres of prime farmland if irrigated, 18 more acres of farmland of statewide importance, and 7 fewer acres of high-value soils. These impacts would occur generally on Links 3-1, 3-2, 3-6, 3-8, 3-80, 3-82, 3-86, 3-88, and 3-92.

This alternative route crosses 10 more acres of CRP lands than the Applicant's Proposed Action Alternative. Where construction disturbance occurs would be reclaimed and the CRP lands would remain under contract. However, acreages of footprints for permanent B2H Project facilities would be calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Flagstaff A – Burnt River Mountain Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 16 more acres of prime farmland if irrigated, 91 more acres of farmland of statewide importance, and 16 more acres of high-value soils. This alternative route would require an estimated long-term disturbance of 5 more acres of prime farmland if irrigated, 28 fewer acres of farmland of statewide importance, and 5 more acres of high-value soils. These impacts would occur generally on Links 3-4, 3-22, 3-24, 3-34, 3-36, 3-38, 3-39, 3-40, 3-46, 3-47, 3-48, 3-52, 3-54, 3-60, 3-62, 3-64, 3-72, 3-76, and 3-88.

This alternative route crosses 17 more acres of CRP lands than the Applicant's Proposed Action Alternative. Where construction disturbance occurs would be reclaimed and the CRP lands would remain under contract. However, acreages of footprints for permanent B2H Project facilities would be calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Flagstaff B Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 16 fewer acres of prime farmland if irrigated, 9 more acres of farmland of statewide importance, and 12 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 6 fewer acres of prime farmland if irrigated, 5 fewer acres of farmland of statewide importance, and 5 fewer acres of high-value soils. These impacts would occur generally on Links 3-4, 3-22, 3-24, 3-31, 3-37, 3-41, 3-44, 3-45, 3-46, 3-48, 3-52, 3-54, 3-58, 3-78, 3-80, 3-82, 3-86, 3-88, and 3-92.

This alternative route crosses the same amount of CRP lands as the Applicant's Proposed Action Alternative. Where construction disturbance occurs would be reclaimed and the CRP lands would

remain under contract. However, acreages of footprints for permanent B2H Project facilities would be calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Flagstaff B – Burnt River West Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 47 fewer acres of prime farmland if irrigated, 106 fewer acres of farmland of statewide importance, and 44 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 13 fewer acres of prime farmland if irrigated, 12 fewer acres of farmland of statewide importance, and 12 fewer acres of high-value soils. These impacts would occur generally on Links 3-10, 3-12, 3-23, 3-31, 3-37, 3-41, 3-43, 3-45, 3-46, 3-48, 3-52, 3-54, 3-60, 3-62, 3-66, 3-71, 3-73, and 3-94.

This alternative route crosses 5 more acres of CRP lands than the Applicant's Proposed Action Alternative. Where construction disturbance occurs would be reclaimed and the CRP lands would remain under contract. However, acreages of footprints for permanent B2H Project facilities would be calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Flagstaff B – Durkee

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 4 fewer acres of prime farmland if irrigated, 149 more acres of farmland of statewide importance, and 39 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 11 fewer acres of prime farmland if irrigated, 87 more acres of farmland of statewide importance, and 9 fewer acres of high-value soils. These impacts would occur generally on Links 3-4, 3-22, 3-24, 3-31, 3-37, 3-41, 3-44, 3-45, 3-46, 3-48, 3-52, 3-54, 3-60, 3-74, 3-90, and 3-94.

This alternative route crosses 3 more acres of CRP lands than the Applicant's Proposed Action Alternative. Where construction disturbance occurs would be reclaimed and the CRP lands would remain under contract. However, acreages of footprints for permanent B2H Project facilities would be calculated and these lands would be removed from contracts, reducing annual payments to landowners.

Conclusions

The Applicant's Proposed Action, Flagstaff A, Flagstaff A – Burnt River Mountain, and Flagstaff B alternatives cross prime farmland if irrigated, farmland of statewide importance, and high-value soils for similar distances. The Timber Canyon, Flagstaff B – Burnt River West, and Flagstaff B – Durkee Alternatives cross those soil types for distances much less than the first group. However, the Timber Canyon and Flagstaff A – Burnt River Mountain Alternatives would affect the most CRP acres. Thus, the Flagstaff A – Burnt River Mountain Alternative would have the most effects on these soils types in Segment 3. The Flagstaff B – Burnt River West Alternative would have the least effects on these soil types in Segment 3.

Livestock Grazing

This section discloses impacts on livestock grazing in Segment 3 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on livestock grazing are presented in Table 3-347. The data used to generate these results are displayed on MV-18. Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Estimated affected AUMs are based off of long-term disturbance on federal grazing allotments. Long-term impacts on AUMs would occur throughout all allotments crossed by a particular segment.

Table 3-347. Estimated Extent of Disturbance of Grazing Allotments in Segment 3—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Applicant's Proposed Action	55.2	35.5	108,963	83,699	6,143	796	248	9
Variation S3-A1	*12.4*	*4.1*	*16,173*	*11,776*	*524*	*86*	*22*	*<1*
Variation S3-A2	*12.2*	*3.9*	*16,173*	*11,456*	*524*	*80*	*20*	*<1*
Variation S3-B1	*13.9*	*12.4*	*29,167*	19,534	*2,154*	*278*	*86*	*3*
Variation S3-B2	*14.4*	*9.0*	*11,799*	*11,799*	*241*	*197*	*58*	*<1*
Variation S3-B3	*14.7*	*9.3*	*11,799*	*11,799*	*241*	*197*	*54*	*0*
Variation S3-B4	*14.3*	*7.8*	*10,045*	*10,045*	*131*	*163*	*43*	*0*
Variation S3-B5	*14.0*	*7.6*	*10,045*	*10,045*	*131*	*164*	*46*	*<1*
Variation S3-C1	*21.1*	*14.1*	*64,015*	*45,265*	*3,795*	*336*	*118*	*6*
Variation S3-C2	*21.7*	*14.1*	*60,206*	*40,271*	*3,701*	*333*	*115*	*4*
Variation S3-C3	*21.1*	*11.1*	*31,146*	*24,736*	*1,756*	*271*	*100*	*4*
Variation S3-C4	*21.4*	*11.6*	*36,070*	*27,009*	*2,545*	*284*	*105*	*4*
Variation S3-C5	*21.0*	*18.2*	*42,022*	*31,415*	*3,406*	*499*	*218*	*8*
Variation S3-C6	*24.7*	*19.9*	*52,437*	*36,529*	*34,779*	*552*	*245*	*17*
Flagstaff A	55.3	30.7	63,245	100,933	74,210	682	208	6
Timber Canyon	70.3	50.4	159,694	120,124	8,491	1,212	434	20
Flagstaff A – Burnt River Mountain	55.3	27.7	82,505	53,682	4,644	621	194	4
Flagstaff B	56.0	32.4	102,688	75,965	5,128	717	217	6

Table 3-347. Estimated Extent of Disturbance of Grazing Allotments in Segment 3—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Flagstaff B – Burnt River West	55.7	36.3	95,135	61,795	6,404	850	290	6
Flagstaff B – Durkee	59.6	38.2	105,551	67,229	7,777	911	322	14

Table Notes:
[1]Data source is U.S. Forest Service and Bureau of Land Management grazing allotments datasets.
[2]Allotment miles crossed by the B2H Project 250-foot right-of-way.
[3]Active animal unit months of allotments crossed by the B2H Project centerline.
[4]Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction and long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing, including estimated AUMs affected. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description. Actual AUMs affected would be calculated and addressed during the permit renewal process.

Applicant's Proposed Action Alternative

As presented in Table 3-347, this alternative route crosses 35.5 miles of allotments (Links 3-4, 3-26, 3-28, 3-54, 3-58, 3-78, 3-80, 3-88, 3-92). An estimated 248 acres of long-term surface disturbance and 796 acres of construction disturbance would be expected. Construction disturbance would affect 1 percent of the surface area of the allotments, which could result in long-term reduced forage by 9 AUMs.

Variations S3-A1 and S3-A2

Variation S3-A1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 0.2 more miles of allotments over S3-A2. This would result in an estimated 2 more acres of long-term surface disturbance and 6 more acres of construction disturbance. S3-A1 is expected to affect slightly more AUMs than S3-A2 long term. Impacts on S3-A1 would occur on Link 3-4, and impacts on S3-A2 would occur on Links 3-10 and 3-12.

Variations S3-B1 through S3-B5

Variation S3-B1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 3.1 more miles of allotments over Variation S3-B3 and is expected to affect the most AUMs (3.3). When comparing these route variations, Variation S3-B1 would have the most long-term surface disturbance of allotments (86 acres) and the most construction disturbance (278 acres). Variation S3-B4 would have the least long-term surface disturbance (43 acres). Impacts on S3-B1 would occur on Links 3-26 and 3-28. Impacts on S3-B2 would occur on Links 3-37, 3-41, 3-46, 3-47, and 3-48. Impacts on S3-B3 would occur on Links 3-37, 3-41, 3-44, 3-45, 3-46, and 3-48. Impacts on S3-B4 would occur on Links 3-32, 3-43, 3-44, and 3-48. Impacts on S3-B5 would occur on Links 3-34, 3-40, 3-46, 3-47, and 3-48.

Variations S3-C1 through S3-C6

Variation S3-C1 is part of the Applicant's Proposed Action Alternative. Variation S3-C6 crosses the most miles of any of these variations (19.9) (Links 3-56, 3-60, 3-74, 3-90) and would result in 127 more acres of long-term surface disturbance and 216 more acres of construction disturbance over Variation S3-C1. Variation S3-C3 crosses the fewest miles of allotments and would result in 18 fewer acres of long-term surface disturbance and 65 fewer acres of construction disturbance than Variation S3-C1. Variation S3-C6 could affect 17 AUMs long term. Impacts on S3-C1 would occur on Links 3-58, 3-78, 3-80, 3-88, and 3-92. Impacts on S3-C2 would occur on Links 3-42, 3-56, 3-78, 3-80, 3-88, and 3-92. Impacts on S3-C3 would occur on Links 3-56, 3-60, 3-62, 3-64, 3-72, 3-76, 3-88, and 3-92. Impacts on S3-C4 would occur on Links 3-56, 3-60, 3-62, 3-68, 3-70, 3-72, 3-76, 3-88, and 3-92. Impacts on S3-C5 would occur on Links 3-56, 3-60, 3-62, 3-66, 3-71, and 3-73. Impacts on S3-C6 would occur on Links 3-56, 3-60, 3-74, and 3-90.

Flagstaff A Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 4.8 fewer miles of allotments resulting in an estimated 40 fewer acres of long-term surface disturbance and 114 fewer acres of construction disturbance. Construction disturbance would affect approximately 1 percent of the surface area of the allotments, which could result in long-term reduced forage by 3 AUMs less than the Applicant's Proposed Action Alternative. These impacts would occur generally on Links 3-4, 3-34, 3-40, 3-46, 3-47, 3-48, 3-54, 3-58, 3-78, 3-80, 3-88, and 3-92.

Timber Canyon Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 14.9 more miles of allotments but would result in 186 more acres of long-term surface disturbance and 416 more acres of construction disturbance. Construction disturbance would affect less than 1 percent of the surface area of the allotments, but is expected to reduce the forage available to livestock by 11 AUMs more than the Applicant's Proposed Action Alternative. These impacts would occur generally on Links 3-1, 3-2, 3-6, 3-8, 3-80, and 3-92.

Flagstaff A – Burnt River Mountain Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 7.8 fewer miles of allotments resulting in an estimated 104 fewer acres of long-term surface disturbance and 175 fewer acres of construction disturbance. Construction disturbance would affect less than 1 percent of the surface area of the allotments, which is expected to affect the forage available to livestock by 5 AUMs fewer than the Applicant's Proposed Action Alternative. This alternative route would have the least disturbance of grazing allotments. These impacts would occur generally on Links 3-4, 3-34, 3-40, 3-46, 3-47, 3-48, 3-54, 3-56, 3-60, 3-62, 3-64, 3-72, 3-76, 3-88, and 3-92.

Flagstaff B Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 3.1 fewer miles of allotments resulting in an estimated 31 fewer acres of long-term surface disturbance and 79 fewer acres of construction disturbance. Construction disturbance would affect less than 1 percent of the

surface area of the allotments, which could over the long term reduce forage by 3 AUMs fewer than the Applicant's Proposed Action long term. These impacts would occur generally on Links 3-4, 3-36, 3-41, 3-44, 3-45, 3-46, 3-48, 3-52, 3-54, 3-58, 3-78, 3-80, 3-88, and 3-92.

Flagstaff B – Burnt River West Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 0.8 more miles of allotments resulting in an estimated 42 more acres of long-term surface disturbance and 54 more acres of construction disturbance. Construction disturbance would affect approximately 1 percent of the surface area of the allotments, which could result in long-term reduced forage by 3 AUMs fewer than the Applicant's Proposed Action Alternative. These impacts would occur generally on Links 3-10, 3-12, 3-37, 3-41, 3-44, 3-45, 3-46, 3-48, 3-54, 3-56, 3-60, 3-62, 3-66, 3-71, and 3-73.

Flagstaff B – Durkee Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 2.7 more miles of allotments resulting in an estimated 74 more acres of long-term surface disturbance and 115 more acres of construction disturbance. Construction disturbance would affect approximately 1 percent of the surface area of the allotments, which could result in long-term reduced forage by 5 AUMs more than the Applicant's Proposed Action Alternative. These impacts would occur generally on Links 3-4, 3-37, 3-41, 3-44, 3-45, 3-46, 3-48, 3-54, 3-56, 3-60, 3-74, and 3-90.

Conclusions

The Timber Canyon and Flagstaff B - Durkee alternatives would result in the highest long-term impacts on grazing allotments. These alternatives also would result in the highest number of long-term reduced forage in AUMs located along these routes. The other alternative routes would result in much less impact on federal grazing AUMs in Segment 3.

SEGMENT 4—BROGAN

Existing Agriculture

This section discloses impacts on existing agriculture in Segment 4 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on existing agriculture are presented in Table 3-348. The data used to generate these results are displayed on MV-16.

Table 3-349 presents the estimated long-term surface disturbance associated with each alternative and route variation. Table 3-350 presents estimated construction disturbance for the alternatives and route variations in Segment 4.

Aerial and ground application of pesticides, in addition to aerial seeding could occur on any cultivated farmland in Segment 4. Impacts include obstruction of flight paths from the tower structures and conductors. There could be increased safety risks to operators navigating around tower structures and conductors. There also could be interruptions in spraying schedules as a result of construction activities, but the Applicant would coordinate with landowners to reduce these impacts. No data are available for a comparison of alternatives and route variations.

Table 3-348. Inventory Data and Residual Impacts for Crop Types and Irrigated Farmland in Segment 4—Brogan

Alternative Route	Total Length (miles)	Irrigation Type (miles crossed)				Crop Type or Confined Animal Feeding Operation (miles crossed)							Overall Residual Impacts (miles crossed)		
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Fallow/Idle Cropland[2]	Field Crops[2]	Fruit and Tree Nuts[2]	Grass/Pasture[2]	Vegetables[2]	Tree Farms[3]	Confined Animal Feeding Operation[4]	Low	Moderate	High
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	0.0	0.0	0.0	7.8	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.0*	*0.0*	*0.0*	*0.0*	*2.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.6*	*0.0*	*0.0*	*0.0*	*1.6*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.5*	*0.0*	*0.0*	*0.0*	*1.5*	*0.0*	*0.0*
Tub Mountain South	40.5	0.0	0.7	1.6	0.3	0.0	2.4	0.0	26.3	0.0	0.0	0.0	26.0	2.1	0.7
Willow Creek	34.6	0.0	1.8	0.2	0.2	0.0	2.3	0.0	13.5	0.0	0.0	0.0	13.5	0.6	1.8

Table Notes:

[1]Data source includes cultivated farmland as seen in aerial imagery and classified as dryland or as an irrigation type. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[2]Data source includes U.S. Department of Agriculture CropScape. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[3]Data source is Boardman Tree Farm digitized from aerial imagery. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[4]Data source is Oregon Department of Agriculture confined animal feeding operations and self-reported dairies. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

Table 3-349. Estimated Long-Term Surface Disturbance of Crop Land and Irrigated Farmland in Segment 4—Brogan

Alternative Route	Total Length (miles)	Estimated Disturbance in Irrigated Farmland (acres)					Estimated Disturbance by Crop Type or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	40.1	0	0	0	0	0	0	0	0	65	0	0	0	65
Variation S4-A1	*5.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*21*	*0*	*0*	*0*	*21*
Variation S4-A2	*6.0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*15*	*0*	*0*	*0*	*15*
Variation S4-A3	*6.1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*14*	*0*	*0*	*0*	*14*
Tub Mountain South	40.5	0	5	11	2	18	0	16	0	179	0	0	0	195
Willow Creek	34.6	0	13	1	1	15	0	16	0	94	0	0	0	111

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-350. Estimated Extent of Construction Disturbance of Crop Land and Irrigated Farmland in Segment 4—Brogan

Alternative Route	Total Length (miles)	Estimated Construction Disturbance in Irrigated Farmland (acres)					Estimated Construction Disturbance of Crop Types or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/ Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	40.1	0	0	0	0	0	0	0	0	186	0	0	0	186
Variation S4-A1	*5.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*52*	*0*	*0*	*0*	*52*
Variation S4-A2	*6.0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*40*	*0*	*0*	*0*	*40*
Variation S4-A3	*6.1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*38*	*0*	*0*	*0*	*38*
Tub Mountain South	40.5	0	16	36	7	58	0	54	0	586	0	0	0	640
Willow Creek	34.6	0	41	5	5	50	0	52	0	304	0	0	0	355

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Applicant's Proposed Action Alternative

This alternative route does not cross moderate or high impacts on existing agriculture.

Variations S4-A1 through S4-A3

These route variations do not cross moderate or high impacts on existing agriculture.

Tub Mountain South Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have an additional 2.8 miles of moderate and high impacts due to crossing irrigated agriculture (Link 4-75) and field crops (Link 4-75). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. Impacts on irrigation include long-term interference with irrigation infrastructure and temporary interruption of irrigation schedules. These impacts would be mitigated using micro-siting, spanning, and coordination with the landowner. Long-term disturbance is estimated to be 195 acres of crops and 18 acres of irrigated agriculture. Construction disturbance is estimated to be 640 acres of crops and 58 acres of irrigated agriculture.

Willow Creek Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have an additional 2.4 miles of moderate and high impacts due to crossing irrigated agriculture (Link 4-60) and field crops (Link 4-60). All pivots could be spanned on this alternative. Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. Impacts on irrigation include long-term interference with irrigation infrastructure and temporary interruption of irrigation schedules. These impacts would be mitigated using micro-siting, spanning, and coordination with the landowner. Long-term disturbance is estimated to be 111 acres of crops and 15 acres of irrigated agriculture. Construction disturbance is estimated to be 355 acres of crops and 50 acres of irrigated agriculture.

Comments on the Draft EIS indicated that the Gum Creek Airstrip was crossed by the right-of-way of this alternative. This 1,950-foot, dirt airstrip has been used for aerial spraying since the early 1980s. It could not continue to operate with the current location of the Willow Creek Alternative. This would affect agriculture throughout the area. Additionally, because the alternative is not linear, it would be difficult for aerial operators to uniformly and efficiently spray crops.

A business owner commented on the Draft EIS that this land has an artesian well used to irrigate agriculture.

The Applicant would work with the landowners to micro-site the transmission line to mitigate impacts on this landing strip and artesian well.

Conclusions

The Applicant's Proposed Action Alternative would have the least impacts on existing agriculture in Segment 4. This alternative route does not cross irrigated agriculture. While both the Tub Mountain South and Willow Creek alternatives cross similar lengths of irrigated agriculture, the Willow Creek

Alternative would affect a landing strip used for agriculture spraying. As a result, this alternative route would have the greatest effects on existing agriculture in Segment 4.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

This section discloses impacts on important farmland, high-value soils, and CRP lands in Segment 4 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on important farmland, high-value soils, and CRP lands are presented in Table 3-351 through Table 3-353. No CRP lands would be crossed by any alternative or route variation in Segment 4. Refer also to MV-17.

Table 3-351. Important Farmland and High-Value Soils in Segment 4-Brogan (miles)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Applicant's Proposed Action	40.1	0.0	7.9	0.0
Variation S4-A1	*5.9*	*0.0*	*5.1*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*5.4*	*0.0*
Variation S4-A3	*6.1*	*0.1*	*5.3*	*0.0*
Tub Mountain South	40.5	2.8	9.7	3.6
Willow Creek	34.6	1.1	7.4	1.1

Table Notes:
[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data
[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained
[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Table 3-352. Estimated Long-term Surface Disturbance of Important Farmland and High-Value Soils in Segment 4-Brogan (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	40.1	0	66	0
Variation S4-A1	*5.9*	*0*	*54*	*0*
Variation S4-A2	*6.0*	*0*	*51*	*0*
Variation S4-A3	*6.1*	*1*	*51*	*0*
Tub Mountain South	40.5	19	66	25
Willow Creek	34.6	8	52	8

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-353. Estimated Extent of Construction Disturbance of Important Farmland and High-Value Soils in Segment 4-Brogan (acres)				
Alternative Route	**Total Length (miles)**	**Prime Farmland if Irrigated**	**Farmland of Statewide Importance**	**High-value Soils**
Applicant's Proposed Action	40.1	0	188	0
Variation S4-A1	*5.9*	*0*	*133*	*0*
Variation S4-A2	*6.0*	*0*	*134*	*0*
Variation S4-A3	*6.1*	*3*	*133*	*0*
Tub Mountain South	40.5	62	216	80
Willow Creek	34.6	25	166	25

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Applicant's Proposed Action Alternative

This alternative route would require an estimated construction disturbance of 188 acres of farmland of statewide importance and an estimated long-term disturbance of 66 acres of farmland of statewide importance. These impacts would occur generally on Links 4-1, 4-10, 4-11, 4-13, 4-25, 4-45, and 4-50. Vegetation clearing would increase the potential for soil loss due to erosion and mixing of topsoil with sub soils on prime farmland and farmland of statewide importance. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Variations S4-A1 through S4-A3

Variation S4-A1 takes the same route as the Applicant's Proposed Action Alternative. Variation S4-A3 is the only route variation that crosses prime farmland if irrigated resulting in an estimated 1 acre of long-term surface disturbance and 3 acres of construction disturbance. Variation S4-A2 crosses the most farmland of statewide importance. Impacts associated with S4-A1 would occur on Links 41, 4-10, 4-11, and 4-13. Impacts associated with S4-A2 would occur on Links 4-1, 4-5, 4-15, and 4-17. Impacts associated with S4-A3 would occur on Links 4-3, 4-11, 4-12, and 4-17.

Tub Mountain South Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 62 more acres of prime farmland if irrigated, 28 more acres of farmland of statewide importance, and 80 more acres of high-value soils. This alternative route would require an estimated long-term disturbance of 19 more acres of prime farmland if irrigated, the same acres of farmland of statewide importance, and 25 more acres of high-value soils. These impacts would occur generally on Links 4-1, 4-5, 4-15, 4-17, 4-20, 4-30, and 4-75.

Willow Creek Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 25 more acres of prime farmland if irrigated, 22 fewer acres of

farmland of statewide importance, and 25 more acres of high-value soils. This alternative route would require an estimated long-term disturbance of 8 more acres of prime farmland if irrigated, 14 fewer acres of farmland of statewide importance, and 8 more acres of high-value soils. These impacts would occur generally on Links 4-1, 4-10, 4-11, 4-13, 4-25, 4-35, and 4-60.

Conclusions

The Tub Mountain South Alternative would have the greatest impacts on prime farmland if irrigated, farmland of statewide importance, and high-value soils in Segment 4, while the Applicant's Proposed Action would have the least. No CRP lands would be crossed in this segment by any alternatives or variations.

Livestock Grazing

This section discloses impacts on livestock grazing in Segment 4 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on livestock grazing are presented in Table 3-354. The data used to generate these results are displayed on MV-18. Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Estimated affected AUMs are based off of long-term disturbance on federal grazing allotments. Long-term impacts on AUMs would occur throughout all allotments crossed by a particular segment.

Table 3-354. Estimated Extent of Disturbance of Grazing Allotments in Segment 4—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Applicant's Proposed Action	40.1	37.2	174,103	144,474	11,517	884	310	26
Variation S4-A1	*5.9*	*5.1*	*29,646*	*28,794*	*232*	*133*	*54*	*<1*
Variation S4-A2	*6.0*	*5.2*	*29,646*	*28,794*	*232*	*129*	*49*	*<1*
Variation S4-A3	*6.1*	*5.3*	*29,646*	*28,794*	*232*	*133*	*51*	*<1*
Tub Mountain South	40.5	31.5	145,876	102,406	21,915	701	215	29
Willow Creek	34.6	23.6	124,642	77,560	14,965	530	166	19

Table Notes:

[1]Data source is U.S. Forest Service and Bureau of Land Management grazing allotments datasets.

[2]Allotment miles crossed by the B2H Project 250-foot right-of-way.

[3]Active animal unit months of allotments crossed by the B2H Project centerline.

[4]Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction and long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing, including estimated AUMs affected. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description. Actual AUMs affected would be calculated and addressed during the permit renewal process.

Applicant's Proposed Action Alternative

As presented in Table 3-354, this alternative route crosses 37.2 miles of allotments (Links, 4-13, 4-25, 4-45, 4-50, 4-65, 4-70). An estimated 310 acres of long-term surface disturbance and 884 acres of construction disturbance would be expected. Construction disturbance would affect less than 1 percent of the surface area of the allotments, which could over the long term reduce forage by 26 AUMs.

Variations S4-A1 through S4-A3

Variation S4-A1 is part of the Applicant's Proposed Action Alternative. Variation S4-A2 would have the least disturbance to grazing allotments (5 acres less than S4-A1 long-term disturbance and 2 acres construction disturbance less than S4-A3). Impacts on S4-A1 would occur on Link 4-13, impacts on S4-A2 would occur on Links 4-15 and 4-17, and impacts on S4-A3 would occur on Links 4-12 and 4-17.

Tub Mountain South Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 5.7 fewer miles of allotments resulting in an estimated 95 fewer acres of long-term surface disturbance and 183 fewer acres of construction disturbance. Construction disturbance would affect less than 1 percent of the surface area of the allotments, which could over the long term reduce forage by 3 AUMs more than the Applicant's Proposed Alternative. These impacts would occur generally on Links 4-15, 4-17, 4-20, 4-30, and 4-75.

Willow Creek Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses 13.6 fewer miles of allotments resulting in an estimated 144 fewer acres of long-term surface disturbance and 354 fewer acres of construction disturbance. Construction disturbance would affect less than 1 percent of the surface area of the allotments, which could over the long term reduce forage by 7 AUMs less than the Applicant's Proposed Alternative. These impacts would occur generally on Links 4-13, 4-25, 4-35, 4-40, 4-60, and 4-70.

Conclusions

The alternative routes and route variations cross a similar amount of grazing allotments within Segment 4. However, the Applicant's Proposed Action would result in 183 more acres of construction disturbance and 95 more acres of long-term impacts than the Tub Mountain South Alternative and 354 more acres of construction disturbance and 144 more acres of long-term disturbance than the Willow Creek Alternative, with Tub Mountain South affecting the most federal grazing allotment AUMs.

SEGMENT 5—MALHEUR

Existing Agriculture

This section discloses impacts on existing agriculture in Segment 5 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on existing agriculture are presented in Table 3-355. The data used to generate these results are displayed on MV-16.

Table 3-356 presents the estimated long-term surface disturbance associated with each alternative and route variation. Table 3-357 presents estimated construction disturbance for the alternatives and route variations in Segment 4.

Aerial and ground application of pesticides, in addition to aerial seeding could occur on any cultivated farmland in Segment 5. Impacts include obstruction of flight paths from the tower structures and conductors. There could be increased safety risks to operators navigating around tower structures and conductors. There also could be interruptions in spraying schedules as a result of construction activities, but the Applicant would coordinate with landowners to reduce these impacts. No data are available for a comparison of alternatives and route variations.

Applicant's Proposed Action Alternative

This alternative has 0.1 mile of moderate impacts due to crossing field crops (Link 5-1). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. They would be mitigated using micro-siting and coordination with the landowner. No high impacts are expected for this alternative. Long-term disturbance is estimated to be 1 acre of field crops and construction disturbance is estimated to be 2 acres of field crops. This alternative route would have the least impacts of all alternative routes in Segment 5.

This alternative route crosses an Owyhee Irrigation District canal and lateral. Comments received on the Draft EIS indicated that this was potentially hazardous because of instability of the soils in the area. Impacts would be reduced by working with the irrigation district to micro-site around and span any infrastructure and sensitive soils.

Variations S5-A1 and S5-A2

Neither of these variations is anticipated to have moderate or high impacts.

Variations S5-B1 and S5-B2

Variation S5-B1 is part of the Applicant's Proposed Action Alternative. Impacts on the variations are anticipated to be similar, with the exception that Variation S5-B1 has no moderate or high impacts; in comparison Variation S5-B2 has 0.5 mile of moderate impacts. These impacts are due to crossing 0.4 mile of flood-irrigated field crops (Link 5-45) and 0.1 mile of fallow/idle cropland (Link 5-45). Impacts on field crops include long-term removal of crops from production and temporary interruption of planting schedules. Impacts on flood irrigation include long-term interference with the flow of water across fields and temporary interruption of irrigation schedules. These impacts would be mitigated using micro-siting, spanning, and coordination with the landowner. No high impacts are expected for this alternative. Long-term disturbance is estimated to be 2 acres of field crops and 2 acres of flood irrigation. Construction disturbance is estimated to be 8 acres of field crops and 8 acres of flood irrigation.

Variation S5-B2 crosses Owyhee Irrigation District laterals three times and a canal once, while Variation S5-B1 crosses a lateral once and a canal once. Comments received on the Draft EIS indicated that this was potentially hazardous because of instability of the soils in the area. Impacts would be reduced by working with the irrigation district to micro-site around and span any infrastructure.

Table 3-355. Inventory Data and Residual Impacts for Crop Types and Irrigated Farmland in Segment 5—Malheur

Alternative Route	Total Length (miles)	Irrigation Type (miles crossed)				Crop Type or Confined Animal Feeding Operation (miles crossed)							Overall Residual Impacts (miles crossed)		
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Fallow/Idle Cropland[2]	Field Crops[2]	Fruit and Tree Nuts[2]	Grass/Pasture[2]	Vegetables[2]	Tree Farms[3]	Confined Animal Feeding Operation[4]	Low	Moderate	High
Applicant's Proposed Action	40.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	27.3	0.0	0.0	0.0	27.3	0.1	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*6.5*	*0.0*	*0.0*	*0.0*	*6.5*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*6.8*	*0.0*	*0.0*	*0.0*	*6.8*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.4*	*0.0*	*0.1*	*0.4*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*1.0*	*0.5*	*0.0*
Malheur S	43.5	0.0	0.0	0.0	0.0	0.2	0.2	0.0	21.5	0.0	0.0	0.0	21.5	0.4	0.0
Malheur A	43.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	20.1	0.0	0.0	0.0	20.1	0.2	0.0

Table Notes:

[1]Data source includes cultivated farmland as seen in aerial imagery and classified as dryland or as an irrigation type. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[2]Data source includes U.S. Department of Agriculture CropScape. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[3]Data source is Boardman Tree Farm digitized from aerial imagery. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[4]Data source is Oregon Department of Agriculture confined animal feeding operations and self-reported dairies. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

Table 3-356. Estimated Long-Term Surface Disturbance of Crop Land and Irrigated Farmland in Segment 5—Malheur

Alternative Route	Total Length (miles)	Estimated Disturbance in Irrigated Farmland (acres)					Estimated Disturbance by Crop Type or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	40.4	0	0	0	0	0	0	1	0	169	0	0	0	170
Variation S5-A1	*7.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*32*	*0*	*0*	*0*	*32*
Variation S5-A2	*7.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*30*	*0*	*0*	*0*	*30*
Variation S5-B1	*2.5*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*3*
Variation S5-B2	*2.8*	*0*	*0*	*2*	*0*	*2*	*0*	*2*	*0*	*5*	*0*	*0*	*0*	*7*
Malheur S	43.5	0	0	0	0	0	1	1	0	144	0	0	0	147
Malheur A	43.1	0	0	0	0	0	0	1	0	125	0	0	0	126

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-357. Estimated Extent of Construction Disturbance of Crop Land and Irrigated Farmland in Segment 5—Malheur

Alternative Route	Total Length (miles)	Estimated Construction Disturbance in Irrigated Farmland (acres)					Estimated Construction Disturbance of Crop Types or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/ Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	40.4	0	0	0	0	0	0	2	0	598	0	0	0	600
Variation S5-A1	*7.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*124*	*0*	*0*	*0*	*124*
Variation S5-A2	*7.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*135*	*0*	*0*	*0*	*135*
Variation S5-B1	*2.5*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*9*	*0*	*0*	*0*	*9*
Variation S5-B2	*2.8*	*0*	*0*	*8*	*0*	*8*	*2*	*8*	*0*	*20*	*0*	*0*	*0*	*30*
Malheur S	43.5	0	0	0	0	0	4	4	0	482	0	0	0	491
Malheur A	43.1	0	0	0	0	0	0	4	0	434	0	0	0	438

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Malheur S Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have an additional 0.3 mile of moderate impacts due to crossing field crops (Link 5-30) and fallow/idle cropland (Links 5-1, 5-25). Types of impacts on field crops would be similar to those discussed for the Applicant's Proposed Action Alternative. No high impacts are expected for this alternative. Long-term disturbance is estimated to be the same disturbance of field crops as the Applicant's Proposed Action and 1 more acre of fallow/idle cropland than the Applicant's Proposed Action. Construction disturbance is estimated to be 2 more acres of field crops and 4 more acres of fallow/idle cropland than the Applicant's Proposed Action Alternative.

This alternative route crosses an Owyhee Irrigation District siphon once, which comments on the Draft EIS indicated was preferable to the Applicant's Proposed Action for reasons of safety and functionality. Impacts would be reduced by working with the irrigation district to micro-site around and span any infrastructure.

Malheur A Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would have an additional 0.1 mile of moderate impacts due to crossing field crops (Links 5-1, 5-25). Types of impacts on field crops would be similar to those discussed for the Applicant's Proposed Action Alternative. No high impacts are expected for this alternative. Long-term disturbance is estimated to be 1 acre of field crops, which is the same as the Applicant's Proposed Action and the Malheur S Alternative. Construction disturbance is estimated to be 4 acres of field crops, which is 2 more than the proposed and the same as Malheur S Alternative.

This alternative route crosses an Owyhee Irrigation District siphon once, which comments on the Draft EIS indicated was preferable to the Applicant's Proposed Action for reasons of safety and functionality.

Conclusions

All alternatives in Segment 5 avoid irrigated agriculture. With the exception of Variation S5-B2, no irrigated agriculture would be affected. Field crops would be affected similarly with each alternative, though the Applicant's Proposed Action Alternative would affect the most crops (largely grass/pasture). The Malheur A Alternative would affect the least crops (largely grass/pasture).

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

This section discloses impacts on important farmland, high-value soils, and CRP lands in Segment 5 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on important farmland, high-value soils, and CRP lands are presented in Table 3-358 through Table 3-360. No CRP lands would be crossed by any alternative or route variation in Segment 5. Refer also to MV-17.

Table 3-358. Important Farmland and High-Value Soils in Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Applicant's Proposed Action	40.4	0.0	0.1	7.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*1.5*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*1.9*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*1.0*
Variation S5-B2	*2.8*	*0.3*	*1.1*	*0.8*
Malheur S	43.5	0.0	0.0	3.3
Malheur A	43.1	0.0	0.0	3.0

Table Notes:
[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data
[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained
[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Table 3-359. Estimated Long-term Surface Disturbance of Important Farmland and High-Value Soils in Segment 5—Malheur (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	40.4	0	1	43
Variation S5-A1	*7.4*	*0*	*0*	*7*
Variation S5-A2	*7.4*	*0*	*0*	*8*
Variation S5-B1	*2.5*	*0*	*0*	*7*
Variation S5-B2	*2.8*	*1*	*5*	*4*
Malheur S	43.5	0	0	22
Malheur A	43.1	0	0	19

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-360. Estimated Extent of Construction Disturbance of Important Farmland and High-Value Soils in Segment 5 Malheur (acres)				
Alternative Route	**Total Length (miles)**	**Prime Farmland if Irrigated**	**Farmland of Statewide Importance**	**High-value Soils**
Applicant's Proposed Action	40.4	0	2	153
Variation S5-A1	*7.4*	*0*	*0*	*29*
Variation S5-A2	*7.4*	*0*	*0*	*38*
Variation S5-B1	*2.5*	*0*	*0*	*22*
Variation S5-B2	*2.8*	*6*	*22*	*16*
Malheur S	43.5	0	0	74
Malheur A	43.1	0	0	65

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Applicant's Proposed Action Alternative

This alternative route would require an estimated construction disturbance of 2 acres of farmland of statewide importance, and 153 acres of high-value soils. This alternative route would require an estimated long-term disturbance of 1 acre of farmland of statewide importance, and 43 acres of high-value soils. These impacts would occur generally on Links 5-15, 5-40, 5-50, 5-55, 5-70, and 5-75. Vegetation clearing would increase the potential for soil loss due to erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Variations S5-A1 and S5-A2

Variation S5-A1 takes the same route as the Applicant's Proposed Action Alternative. Neither of these route variations crosses prime farmland if irrigated nor farmland of statewide importance and, thus, impacts are not expected. Compared to Variation S5-A2, this alternative route would require an estimated construction disturbance of 9 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 1 fewer acres of high-value soils. Impacts associated with Variation S5-A1 would occur on Link 5-15, and impacts associated with Variation S5-A2 would occur on Link 5-20.

Variations S5-B1 and S5-B2

Variation S5-B1 is part of the Applicant's Proposed Action Alternative. Compared to Variation S5-B2, this alternative route would require an estimated construction disturbance of 6 more acres of prime farmland if irrigated, 22 more acres of farmland of statewide importance, and 6 more acres of high-value soils. This alternative route would require an estimated long-term disturbance of 1 fewer acres of prime farmland if irrigated, 5 more acres of farmland of statewide importance, and 3 more acres of high-value soils. Impacts associated with Variation S5-B1 would occur on Links 5-50 and 5-55, and impacts associated with Variation S5-B2 would occur on Link 5-45.

Malheur S Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 2 fewer acres of farmland of statewide importance, and 79 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 1 less acre of farmland of statewide importance, and 21 fewer acres of high-value soils. These impacts would occur generally on Links 5-25, 5-30, and 5-75.

Malheur A Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route would require an estimated construction disturbance of 2 fewer acres of farmland of statewide importance, and 88 fewer acres of high-value soils. This alternative route would require an estimated 1 less acre of long-term disturbance of farmland of statewide importance and 24 fewer acres of long-term disturbance of high-value soils. These impacts would occur generally on Links 5-25, and 5-35.

Conclusions

The Applicant's Proposed Action Alternative crosses over twice the miles of high-value soils of any other alternative in Segment 5, and would have the highest impacts. Both the Malheur S and Malheur A alternatives would have similar impacts. No CRP acres would be crossed by any alternative or variation in this segment.

Livestock Grazing

This section discloses impacts on livestock grazing in Segment 5 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on livestock grazing are presented in Table 3-361. The data used to generate these results are displayed on MV-18. Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Estimated affected AUMs are based off of long-term disturbance on federal grazing allotments. Long-term impacts on AUMs would occur throughout all allotments crossed by a particular segment.

Table 3-361. Estimated Extent of Disturbance of Grazing Allotments in Segment 5—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Applicant's Proposed Action	40.4	38.8	330,608	130,021	32,520	849	240	15
Variation S5-A1	*7.4*	*7.1*	*120,336*	*30,383*	*12,205*	*135*	*35*	*<1*
Variation S5-A2	*7.4*	*7.4*	*120,336*	*33,409*	*12,205*	*147*	*33*	*4*
Variation S5-B1	*2.5*	*2.0*	*96,887*	20,962	*7,084*	*45*	*15*	*<1*
Variation S5-B2	*2.8*	*0.8*	*96,887*	20,962	*7,084*	*16*	*4*	*<1*

Table 3-361. Estimated Extent of Disturbance of Grazing Allotments in Segment 5—Morrow-Umatilla

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Malheur S	43.5	42.8	305,483	124,093	27,970	958	286	22
Malheur A	43.1	42.4	305,483	124,093	27,970	917	263	20

Table Notes:
[1]Data source is U.S. Forest Service and Bureau of Land Management grazing allotments datasets.
[2]Allotment miles crossed by the B2H Project 250-foot right-of-way.
[3]Active animal unit months of allotments crossed by the B2H Project centerline.
[4]Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction and long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing, including estimated AUMs affected. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description. Actual AUMs affected would be calculated and addressed during the permit renewal process.

Applicant's Proposed Action Alternative

As presented in Table 3-361, this alternative route crosses 38.8 miles of allotments (Links 5-1, 5-5, 5-10, 5-15, 5-40, 5-50, 5-55, 5-65, 5-70, 5-75). An estimated 240 acres of long-term surface disturbance and 849 acres of construction disturbance would be expected. Area of vegetation clearing would affect less than 1 percent of the surface area of the allotments, which could over the long term reduce forage by 15 AUMs.

Variations S5-A1 and S5-A2

Variation S5-A1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 0.3 fewer miles of allotments than Variation S5-A2. Variation S5-A1 would have an estimated additional 2 acres of long-term surface disturbance and 12 fewer acres of construction disturbance. For Variation S5-A1, this could over the long term reduce forage by approximately 4 AUMs fewer than Variation S5-A2. Impacts on S5-A1 would occur on Link 5-15, and impacts on S5-A2 would occur on Link 5-20.

Variations S5-B1 and S5-B2

Variation S5-B1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 1.2 additional miles of allotments over Variation S5-B2 resulting in an estimated 11 more acres of long-term surface disturbance and 29 more acres of construction disturbance over Variation S5-B2. This could over the long term reduce forage by slightly more AUMs than S5-B2. Impacts on S5-B1 would occur on Links 5-50, 5-55, and 5-65, and impacts on S5-B2 would occur on Link 5-45.

Malheur S Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses an additional 4 miles of allotments resulting in an estimated 46 more acres of long-term surface disturbance and 109

more acres of construction disturbance. Construction disturbance would affect less than 1 percent of the surface area of the allotments, but could result in long-term reduced forage by 7 AUMs more than the Applicant's Proposed Action Alternative. These impacts would occur generally on Links 5-1, 5-5, 5-25, 5-30, and 5-75.

Malheur A Alternative

Compared to the Applicant's Proposed Action Alternative, this alternative route crosses an additional 3.6 miles of allotments resulting in an estimated 23 more acres of long-term surface disturbance and 68 more acres of construction disturbance. Construction disturbance would affect less than 1 percent of the surface area of the allotments, but could result in long-term reduced forage by 5 AUMs more than the Applicant's Proposed Action Alternative. These impacts would occur generally on Links 5-1, 5-5, 5-25, and 5-35.

Conclusions

The alternative routes and route variations cross a similar amount of grazing allotments within Segment 5. However, the Applicant's Proposed Action Alternative would affect fewer acres over the long-term impacts and have result in fewer reduction in forage than the Malheur S and Malheur A alternatives.

SEGMENT 6—TREASURE VALLEY

Existing Agriculture

This section discloses impacts on existing agriculture in Segment 6 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on existing agriculture are presented in Table 3-362. The data used to generate these results are displayed on MV-16.

Table 3-363 presents the estimated long-term surface disturbance associated with each alternative and route variation. Table 3-364 presents estimated construction disturbance for the alternatives and route variations in Segment 6.

Aerial and ground application of pesticides, in addition to aerial seeding could occur on any cultivated farmland in Segment 6. Impacts include obstruction of flight paths from the tower structures and conductors. There could be increased safety risks to operators navigating around tower structures and conductors. There also could be interruptions in spraying schedules as a result of construction activities, but the Applicant would coordinate with landowners to reduce these impacts. No data are available for a comparison of alternatives and route variations for spraying.

Applicant's Proposed Action Alternative

This alternative has 0.3 mile of moderate impacts due to crossing flood irrigation at Link 6-35. Impacts on flood irrigation include long-term interference with the flow of water across fields and temporary interruption of irrigation schedules. These impacts would be mitigated using micro-siting and coordination with the landowner. No high impacts are expected for this alternative.

Table 3-362. Inventory Data and Residual Impacts for Crop Types and Irrigated Farmland in Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Irrigation Type (miles crossed)				Crop Type or Confined Animal Feeding Operation (miles crossed)							Overall Residual Impacts (miles crossed)		
		Dryland[1]	Center Pivot Irrigation[1]	Flood Irrigation[1]	Other Mechanized Irrigation[1]	Fallow/Idle Cropland[2]	Field Crops[2]	Fruit and Tree Nuts[2]	Grass/Pasture[2]	Vegetables[2]	Tree Farms[3]	Confined Animal Feeding Operation[4]	Low	Moderate	High
Applicant's Proposed Action	28.0	0.0	0.0	0.3	0.0	0.0	0.2	0.0	11.9	0.0	0.0	0.0	11.8	0.3	0.0
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.6*	*0.0*	*0.0*	*0.0*	*3.6*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.1*	*0.0*	*0.0*	*0.0*	*5.1*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.8*	*0.0*	*0.0*	*0.0*	*5.8*	*0.0*	*0.0*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.2*	*0.0*	*0.0*	*0.0*	*4.2*	*0.0*	*0.0*

Table Notes:

[1]Data source includes cultivated farmland as seen in aerial imagery and classified as dryland or as an irrigation type. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[2]Data source includes U.S. Department of Agriculture CropScape. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[3]Data source is Boardman Tree Farm digitized from aerial imagery. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

[4]Data source is Oregon Department of Agriculture confined animal feeding operations and self-reported dairies. Resource inventory is crossed by the 250-foot right-of-way for each alternative route and route variation.

Table 3-363. Estimated Long-Term Surface Disturbance of Crop Land and Irrigated Farmland in Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Estimated Disturbance in Irrigated Farmland (acres)					Estimated Disturbance by Crop Type or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	28.0	0	0	7	0	7	0	4	0	261	0	0	0	265
Variation S6-A1	*9.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*80*	*0*	*0*	*0*	*80*
Variation S6-A2	*8.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*112*	*0*	*0*	*0*	*112*
Variation S6-B1	*14.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*126*	*0*	*0*	*0*	*126*
Variation S6-B2	*14.1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*92*	*0*	*0*	*0*	*92*

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-364. Estimated Extent of Construction Disturbance of Crop Land and Irrigated Farmland in Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Estimated Construction Disturbance in Irrigated Farmland (acres)					Estimated Construction Disturbance of Crop Types or Confined Animal Feeding Operation (acres)							
		Dryland	Center Pivot Irrigation	Flood Irrigation	Other Mechanized Irrigation	Total Irrigated Farmland Disturbance	Fallow/ Idle Cropland	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farms	Confined Animal Feeding Operation	Total Crop or Confined Animal Feeding Operation Disturbance
Applicant's Proposed Action	28.0	0	0	0	0	0	0	2	0	598	0	0	0	600
Variation S5-A1	*9.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*124*	*0*	*0*	*0*	*124*
Variation S5-A2	*8.9*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*135*	*0*	*0*	*0*	*135*
Variation S5-B1	*14.4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*9*	*0*	*0*	*0*	*9*
Variation S5-B2	*14.1*	*0*	*0*	*8*	*0*	*8*	*2*	*8*	*0*	*20*	*0*	*0*	*0*	*30*

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Variations S6-A1 and S6-A2

Variation S6-A1 is part of the Applicant's Proposed Action Alternative. Neither variation is expected to have moderate or high impacts.

Variations S6-B1 and S6-B2

Variation S6-B1 is part of the Applicant's Proposed Action Alternative. Neither variation is expected to have moderate or high impacts.

Conclusion

The only alternative in this area of Segment 6, the Applicant's Proposed Action Alternative, would have impacts on existing irrigated agriculture. Effects would occur near the Hemingway Substation. With construction of the B2H Project, these impacts could not be avoided as there is no variation in this area that would avoid this irrigated farmland.

Important Farmland, High-Value Soils, and Conservation Reserve Program Lands

This section discloses impacts on important farmland, high-value soils, and CRP lands in Segment 6 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on important farmland, high-value soils, and CRP lands are presented in Table 3-365 through Table 3-367. Refer also to MV-17. No CRP lands are crossed by any alternative route or route variation in Segment 6.

Table 3-365. Important Farmland and High-Value Soils in Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated[1,2]	Farmland of Statewide Importance[1]	High-value Soils[1,3]
Applicant's Proposed Action	28.0	5.7	2.6	5.4
Variation S6-A1	*9.3*	*0.7*	*0.0*	*0.6*
Variation S6-A2	*8.9*	*0.9*	*0.5*	*1.4*
Variation S6-B1	*14.4*	*2.5*	*2.6*	*2.2*
Variation S6-B2	*14.1*	*1.4*	*3.0*	*1.6*

Table Notes:

[1]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data

[2]This includes prime farmland if irrigated and prime farmland if irrigated and drained

[3]Data source is the Natural Resources Conservation Service SSURGO/STATSGO2 soils data irrigated and nonirrigated capability classes I-II, prime farmland if irrigated, and prime farmland if irrigated and drained.

Table 3-366. Estimated Long-term Surface Disturbance of Important Farmland and High-Value Soils in Segment 6- Treasure Valley (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	28.0	35	16	33
Variation S6-A1	*9.3*	*5*	*0*	*4*
Variation S6-A2	*8.9*	*6*	*3*	*9*
Variation S6-B1	*14.4*	*15*	*16*	*13*
Variation S6-B2	*14.1*	*9*	*20*	*10*

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Table 3-367. Estimated Extent of Construction Disturbance of Important Farmland and High-Value Soils in Segment 6- Treasure Valley (acres)

Alternative Route	Total Length (miles)	Prime Farmland if Irrigated	Farmland of Statewide Importance	High-value Soils
Applicant's Proposed Action	28.0	125	57	118
Variation S6-A1	*9.3*	*15*	*0*	*13*
Variation S6-A2	*8.9*	*20*	*11*	*31*
Variation S6-B1	*14.4*	*54*	*56*	*48*
Variation S6-B2	*14.1*	*31*	*66*	*35*

Table Note: Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description.

Applicant's Proposed Action Alternative

This alternative route would require an estimated construction disturbance of 125 acres of prime farmland if irrigated, 57 acres of farmland of statewide importance, and 118 acres of high-value soils. This alternative route would require an estimated long-term disturbance of 35 acres of prime farmland if irrigated, 16 acres of farmland of statewide importance, and 33 acres of high-value soils. These impacts would occur generally on Links 6-20, 6-25, and 6-35. Vegetation clearing would increase the potential for soil loss due to erosion and mixing of topsoil with sub soils on prime farmland, farmland of statewide importance, and high-value soils. Long-term effects could include permanent conversion of these soils to nonagricultural uses where permanent B2H Project facilities such as tower structures would be located.

Variations S6-A1 and S6-A2

Variation S6-A1 is part of the Applicant's Proposed Action Alternative. Impacts for the variations are anticipated to be similar, however when compared to Variation S6-A2; this alternative route would require an estimated construction disturbance of 5 fewer acres of prime farmland if irrigated, 11 fewer

acres of farmland of statewide importance, and 18 fewer acres of high-value soils. This alternative route would require an estimated long-term disturbance of 1 fewer acre of prime farmland if irrigated, 3 fewer acres of farmland of statewide importance, and 5 fewer acres of high-value soils. Impacts associated with Variation S6-A1 would occur on Link 6-20, and impacts associated with Variation S6-A2 would occur on Link 6-15.

Variations S6-B1 and S6-B2

Variation S6-B1 is part of the Applicant's Proposed Action Alternative. Impacts on the variations are anticipated to be similar, however, when compared to Variation S6-B2; this alternative route would require an estimated construction disturbance of 23 additional acres of prime farmland if irrigated, 10 fewer acres of farmland of statewide importance, and 13 more acres of high-value soils. This alternative route would require an estimated long-term disturbance of 6 additional acres of prime farmland if irrigated, 4 fewer acres of farmland of statewide importance, and 3 more acres of high-value soils. Impacts associated with Variation S6-B1 would occur on Link 6-25, and impacts associated with Variation S6-B2 would occur on Link 6-30. Issues associated with vegetation clearing and long-term effects would be similar to those discussed for the Applicant's Proposed Action Alternative.

Conclusion

Among the variations in Segment 6, Variation S6-A2 and Variation S6-B1 would have the greatest impacts on prime farmland if irrigated, farmland of statewide importance, and high-value soils. No CRP acres would be crossed in this segment.

Livestock Grazing

This section discloses impacts on livestock grazing in Segment 6 by alternative route and route variation. The results of the analysis to assess the impacts of the B2H Project on livestock grazing are presented in Table 3-368. The data used to generate these results are displayed on MV-18. Refer also to Appendix G for more information regarding allotments crossed by each alternative route and route variation. Estimated affected AUMs are based off of long-term disturbance on federal grazing allotments. Long-term impacts on AUMs would occur throughout all allotments crossed by a particular segment.

Table 3-368. Estimated Extent of Disturbance of Grazing Allotments in Segment 6- Treasure Valley

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Applicant's Proposed Action	28.0	24.6	171,295	146,011	13,458	539	153	9
Variation S6-A1	*9.3*	*8.4*	*84,949*	*41,399*	*7,029*	*186*	*60*	*4*
Variation S6-A2	*8.9*	*6.6*	*84,949*	*41,399*	*7,029*	*145*	*44*	*2*

Table 3-368. Estimated Extent of Disturbance of Grazing Allotments in Segment 6- Treasure Valley

Alternative Route	Total Length (miles)	Allotment/ Pasture Miles[1,2]	Total Acres of Allotments[1]	Total Acres of Pastures[1,2]	Active Animal Unit Months[1,3]	Estimated Construction Disturbance[1,4] (acres)	Estimated Long-term Surface Disturbance (acres)[1,4]	Estimated Animal Unit Months Affected (long term)[4,5]
Variation S6-B1	*14.4*	*13.5*	*91,626*	91,626	*7,169*	*293*	*82*	*4*
Variation S6-B2	*14.1*	*13.6*	*97,837*	92,966	*7,793*	*298*	*88*	*5*

Table Notes:
[1]Data source is U.S. Forest Service and Bureau of Land Management grazing allotments datasets.
[2]Allotment miles crossed by the B2H Project 250-foot right-of-way.
[3]Active animal unit months of allotments crossed by the B2H Project centerline.
[4]Additional analysis was completed for each of the resources in the Agriculture section. This analysis was to estimate the acreage of construction and long-term surface disturbance of existing agriculture, important farmland and high-value soils, and livestock grazing, including estimated AUMs affected. However, because the alternative routes have not been engineered, these acreages are predictive and for comparison purposes only. They are based off typical features of a 500-kV transmission line as described in the Project Description. Actual AUMs affected would be calculated and addressed during the permit renewal process.

Applicant's Proposed Action Alternative

As presented in Table 3-368, this alternative route crosses 24.6 miles of allotments (Links 6-1, 6-10, 6-20, 6-25, 6-35). An estimated 153 acres of long-term surface disturbance and 539 acres of construction disturbance would be expected. Area of vegetation clearing would affect less than 1 percent of the surface area of the allotments, which could over the long term reduce forage by 9 AUMs.

Variations S6-A1 and S6-A2

Variation S6-A1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 1.8 additional miles of allotments over Variation S6-A2 resulting in an estimated additional 16 acres of long-term surface disturbance and 41 acres of construction disturbance. Variation S6-A1 could reduce forage by 2 AUMs more than Variation S6-A2. Impacts on S6-A1 would occur on Links 6-10 and 6-20, and impacts on S6-A2 would occur on Links 6-5 and 6-15.

Variations S6-B1 and S6-B2

Variation S6-B1 is part of the Applicant's Proposed Action Alternative. This route variation crosses 0.1 fewer miles of allotments compared to Variation S6-B2 resulting in an estimated 6 fewer acres of long-term surface disturbance and 5 fewer acres of construction disturbance. Variation S6-B2 could reduce forage by 1 AUM more than Variation S6-B1. Impacts on S6-B1 would occur on Link 6-25, and impacts on S6-A2 would occur on Link 6-30.

Conclusion

The route variations in Segment 6 cross a similar amount of grazing allotments within Segment 6. Variations S6-A2 and S6-B1 would affect fewer acres of AUMs in Segment 6.

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3.2.8 RECREATION

3.2.8.1 INTRODUCTION

This section describes recreation resources analyzed for the B2H Project. The regulatory framework, issues identified for analysis, methods, affected environment and environmental consequences are described in the following section.

3.2.8.2 REGULATORY FRAMEWORK

The BLM manages land uses on public lands, including recreational activities, through adoption and implementation of RMPs. The B2H Project would be located on BLM-administered lands managed under three RMPs: the Baker RMP and SEORMP in Oregon and the Owyhee RMP in Idaho.

BUREAU OF LAND MANAGEMENT

Baker Resource Management Plan

The Baker RMP (BLM 1989) includes provisions to protect or enhance cultural resources, soil, water, botanical resources, visual resources, recreational opportunities, and other resources. OHV designations were approximately 287,611 acres open, 138,042 acres limited, and 4,101 acres closed. In 2015, these allocations were amended by the Greater Sage-Grouse Resource Management Plan Amendment and have changed to approximately 81,830 acres open, 319,853 acres limited to designated routes, and 30,834 acres closed to OHV use.[2] The management direction for recreation in the Baker RMP states:

Provide or enhance recreational opportunities for hunting, fishing, swimming, floating, boating, hiking, and sightseeing. Implement and develop site specific management plans for Special Recreation Management Areas; and the Extensive Recreation Management Area that contains high recreational values. (BLM 1989)

The Baker RMP also identifies Special Recreation Management Areas and Extensive Recreation Management Areas for priority recreation management.

The BLM is revising the RMP for the Baker Field Office management area. A Draft RMP/EIS was issued in October 2011 (BLM 2011) and is available online. The draft RMP identifies 6 alternative management scenarios, and it is likely that management direction for recreational activities may change on adoption of the revised RMP. Depending on the timing of the RMP revision, the regulatory framework for recreation as it relates to the B2H Project may change.

Southeastern Oregon Resource Management Plan

The SEORMP (BLM 2002) designates public recreational lands within the jurisdiction of the RMP into six Recreation Opportunity Spectrum (ROS) classes: primitive, semi-primitive non- motorized, semi-

[2]The OHV management designation numbers used for the Baker Field Office are approximate based on current BLM ownership lands, and have been updated based on the Sage-Grouse RMP Amendments. The data used for this analysis does not include lands withdrawn from BLM for use by other federal agencies.

primitive motorized, roaded natural, rural, and urban. The ROS is a recreation management tool developed by the USFS in the early 1980s to manage and administer natural settings for specific visitor experiences. The ROS management approach also is used by the BLM in some RMPs. The ROS class areas are mapped, and the ROS classes provide descriptions of the desired visitor recreational experience in the class area and a benchmark for analyzing the effects of the B2H Project on recreation. Additional information about ROS recreation management is provided in the discussion of the Wallowa-Whitman LRMP.

The SEORMP established the Owyhee River below the Dam special recreation management area (SRMA).

Of the lands managed in the SEORMP area, OHV designations were approximately 2,615,066 acres open, 2,004,396 acres limited to designated routes, and 15,826 acres closed. In 2015, these designations were amended by the Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment and have changed to approximately 359,542 acres open, 4,236,406 acres limited to designated routes, and 15,828 closed to OHV use.

Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

The purpose of this plan was to amend eight eastern Oregon Resource Management Plans (Andrews, Baker, Brothers LaPine, Lakeview, Southeastern Oregon, Steens, Three Rivers, and Upper Deschutes) to identify and incorporate appropriate conservation measures to conserve, enhance, and/or restore GRSG habitat by reducing, eliminating, or minimizing threats to that habitat. It was identified in this plan's Final EIS that recreation could pose a threat to Greater Sage-Grouse and its habitat. Therefore, objectives were developed to manage OHVs to conserve Greater Sage-Grouse and its habitat (BLM 2015)

Owyhee Resource Management Plan

The Owyhee RMP (BLM 1999) identifies seven objectives for recreation management, and accompanying management actions and allocations. The seven recreation objectives include:

- RECT-1—Provide for off-highway motor vehicle use on public lands while protecting sensitive resource values.
- RECT-2—Provide special management attention to areas of public land with identified special recreational, scenic, and cultural values where current and projected recreational demand warrants intensive management.
- RECT-3—Determine the suitability of all eligible rivers and streams for inclusion in the National Wild and Scenic Rivers System.
- RECT-4—Provide for high-quality recreational opportunities and experiences at developed and undeveloped recreation sites by maintaining existing amenities (roaded natural, urban and semi-primitive motorized settings) and by providing new recreation sites for the public's enjoyment, with emphasis on roaded natural and semi-primitive motorized settings.

- RECT-5—Develop a trail system that provides a range of motorized and non-motorized recreation opportunities for the public's enjoyment of primitive, semi-primitive non-motorized, semi-primitive motorized, and roaded natural settings.
- RECT-6—Pursue increased public access opportunities in motorized and non-motorized settings through the acquisition of fee titles or recreational easements (willing landowners only).
- RECT-7—Retain at least 10 percent of the Owyhee Field Office in a primitive recreational opportunity spectrum setting.

The Owyhee RMP, the Owyhee Omnibus Bill, and the Idaho and Southwestern Montana Greater Sage-Grouse ARMPA established guidance for managing a broad spectrum of OHV designations (194 acres open, 1,000,791 limited, and 258,904 are closed).

U.S. Forest Service

The USFS manages land uses, including recreational uses, on National Forest System lands through adoption and implementation of LRMPs. The Proposed Action and several alternatives would be located on lands managed under the Wallowa-Whitman LRMP.

Wallowa-Whitman National Forest Land and Resource Management Plan

The Wallowa-Whitman National Forest provides a wide variety of recreation activities, such as snowmobiling, skiing, hiking, horseback riding, and camping. The Wallowa-Whitman National Forest LRMP establishes forest-wide multiple-use goals and objectives and standards and guidelines and sets prescriptions, standards, and guidelines for each management area identified in the plan. The LRMP also establishes and maps five ROS classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, and rural (USFS 1990).

Bureau of Reclamation

Reclamation's RMPs provide a guide for creating a balance for resource development, recreation, and protection of natural and cultural resources for the lands and waters they manage. Several alternatives would be located on lands managed under Reclamation's 1994 Owyhee Reservoir RMP.

Owyhee Reservoir Resource Management Plan

The Owyhee Reservoir RMP (Reclamation 1994) defines the resource management activities and guidelines needed to preserve and protect the existing land and water resources administered by the Reclamation in the vicinity of the Owyhee Reservoir in Malheur County, Oregon. The RMP planning area includes approximately 26,190 acres of land and 12,740 acres of water surface (at full-pool elevation of 2,670 feet) comprising lands adjacent to the Owyhee Reservoir and parts of the Owyhee River system above and below the reservoir.

Recreation opportunities consist of land and water-based activities primarily during the summer. Land based recreation opportunities consist of hunting, camping, hiking, OHV use, wildlife observation, picnicking, and rock hounding. Water-based recreation opportunities include fishing, motorized and whitewater boating, windsurfing, and swimming.

The RMP was developed in cooperation with several other agencies to balance desired public recreational uses of the Reclamation lands and waters with the protection and improvement of existing resources specific to the Owyhee Reservoir study area. Land-use agreements have allowed for the establishment of the Owyhee State Park, the Lake Owyhee Resort, and the Pelican Point Airstrip along with other recreational activity sites within the RMP area.

STATE AND LOCAL GOVERNMENTS

State and local governments frequently include recreation elements in their land-use plans and a variety of permits, licenses and regulations address recreational activities statewide. This includes recreational activities such as hunting, fishing, boats and recreational vehicles. For example, before the Oregon Department of Energy will grant a site certificate, the Council must find that a facility will not significantly adversely affect important recreational opportunities, including recreation opportunities on public lands.

3.2.8.3 ISSUES IDENTIFIED FOR ANALYSIS

During scoping and review of the Draft EIS, issues were raised by the public and agencies. The issues and information related to potential impacts on recreation resources are included below and were used to guide the focus and level of detail of the NEPA analysis.

- Will there be economic effects on recreation and tourism? (refer to Section 3.2.17)
- Would there be any effects on recreational facilities?
- Would any recreation activities change?
- Will there be economic impacts on the Baker City community and on the community's economic development potential as a premier outdoor recreation and tourism center? (refer to Section 3.2.17)
- Will there be impacts on the Blue Mountain Heritage Trails network regional economic development initiative and on the Base Camp Baker branding and economic development program now under way? (refer to Section 3.2.17)
- Will the B2H Project adversely affect the BLM National Historic Oregon Trail Interpretive Center? (also refer to Sections 3.2.15 and 3.2.17)
- Would there be any changes in hunting and fishing activities, including subsistence hunting and fishing?

3.2.8.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.3. This section discusses how the study methods are applied to assess the impacts of the B2H Project on recreation.

DATA SOURCES

The analyses were conducted using the best available spatial data. Data sources include:

- Trails data obtained from BLM, NPS, USFS and Idaho Parks and Recreation (IDPR)
- Scenic Byway and Backway data obtained from BLM, Oregon Department of Transportation, and Washington Department of Transportation
- Recreation Sites data obtained from BLM, USFS, IDPR, Morrow County, LDS Church, and Logan Simpson Design
- Hunting Area data obtained from IDPR, ODFW, and Morrow County
- ERMAs and SRMAs obtained from BLM
- State Parks obtained from Oregon Parks and Recreation Department (OPRD)
- ROS data obtained from BLM and USFS
- OHV Designation data obtained from BLM

MV-19 show inventoried recreational resources in the study corridor for recreation resources.

ANALYSIS AREA

The analysis area for recreational resources is a 1-mile-wide study corridor (i.e., 0.5 mile on each side of the alternative route centerlines). The study corridor includes sites for substations, communication sites, multiple-use areas, and fly yards.

Dispersed Recreation

Public lands provide a broad spectrum of outdoor opportunities that afford visitors the freedom of recreational choice, self-discovery and challenge. Public lands in Oregon and Idaho receive considerable recreational use in the form of dispersed, unstructured activities outside designated-use areas. Dispersed recreational activities are activities that occur on public lands but are not located at developed sites or locations. These dispersed activities include OHV use, camping, hunting, fishing, touring historic trails, sightseeing, pleasure driving, birding, rock hounding, photography, picnicking, hiking, mountain biking, snowmobiling, rafting, power boating, and general water play. This wide range of activities is possible because land within the study corridor is generally accessible and offers a variety of settings suitable for different recreational activities. Below lists some of the types of dispersed recreation throughout the study corridor:

Camping

Dispersed camping is located predominately near existing trails or roads and do not have permanent infrastructure in place (e.g., restrooms, running water, etc.). Short-term effects on dispersed camping from construction activities would include visual, noise, dust, and vehicle emission impacts from construction equipment and restriction or closure of campsite access points. Long-term effects generally would be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line.

Non-Motorized Recreation Users

Non-motorized users include hikers, backpackers, mountain bikers, horseback riders, and individuals participating in geo-caching. Non-motorized users are generally drawn to disperse recreation areas with little evidence of human presence. Trail systems allow for non-motorized users to access disperse recreation areas. Short-term effects on non-motorized users would include restriction or temporary closure of access to trails and associated facilities (e.g., campgrounds, trailhead facilities, restrooms, etc.), as well as a temporary increase of dust, vehicle emissions, visual, and noise impacts from construction equipment and activities. Long-term effects from the B2H Project on non-motorized users could include views influenced or dominated by the B2H Project infrastructure. Occasional noise and dust may occur during maintenance activities on the transmission line.

Hunting in the study corridor varies by season and location. Small and large game hunting occurs at different times throughout the year as permitted by the ODFW and IDFG. All recreational uses in the study corridor are variable in terms of season of use or location. Hunting areas located within the study corridor include Fur Mountain Access Area, Glass Hill Access Area, M.R. King Ranches Access Area, and Troy Ranches Access Area. Refer to Section 3.2.12 for further discussion related to visual impacts from the B2H Project to these areas.

In addition to the dispersed recreation activities described above, subsistence hunting and fishing (traditional foods/first foods) also occur in the study corridor. The CTUIR DNR adopted the following mission:

> To protect, restore, and enhance the First Foods – water, salmon, deer, cous, and huckleberry – for the perpetual cultural, economic, and sovereign benefit of the CTUIR. We will accomplish this utilizing traditional ecological and cultural knowledge and science to inform: (1) population and habitat management goals and actions; and (2) natural resource policies and regulatory mechanisms.

Refer to Sections 3.2.2 through 3.2.6, Section 3.2.13, and Section 3.2.17 for further discussion related to the hunting and fishing treaty rights of tribes throughout the B2H Project area.

Off-Highway Vehicle Use/Trails

The non-highway road networks within the study corridor comprise a series of county roads, BLM- and USFS-maintained roads, private (ungated) roads, 2-track routes, two-wheel trails, and snowmobile trails. The BLM categorizes travel routes on public lands in three categories:

- Road – A linear route declared a road by the owner, managed for low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.
- Primitive Road – A linear route managed for use by four-wheel-drive or high clearance vehicles. Primitive roads do not normally meet any BLM road design standards.
- Trail – A linear route managed for human-powered, stock, or off-highway vehicle forms of transportation, or for historical or heritage values. Trails are generally not managed for use by four-wheel-drive or high clearance vehicles.

These travel routes are used for both recreational and non-recreational purposes.

Typical recreational OHV activities within the study corridor include trail competitions, recreational all-terrain vehicle and motorcycle trail riding, and snowmobiling.

Non-recreational OHV use includes energy development, and land management activities. OHVs also are used for the noncommercial collection of decorative rock and native plant materials. Employees of government agencies, ranchers, timber companies, energy companies, and utility providers are permitted users who use OHVs to access and maintain the infrastructure required for the continued operation and maintenance of their facilities. OHVs are used for range inspections, vegetation treatments, surveying and mapping, inventories, monitoring, fire suppression, project construction, and maintenance.

The OHV designations for BLM-managed lands are determined through travel management planning and are incorporated into their RMPs. BLM's OHV designations are defined as follows (43 CFR 8342.1):

- Open. An area where all types of vehicle use is permitted at all times.
- Limited. An area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated in the following categories: numbers of vehicles; types of vehicles; time of season of vehicle use; permitted or licensed use only; use on existing roads and trails; use on designated roads and trails; and other restrictions.
- Closed. An area where off-road vehicle use is prohibited. Use of off-road vehicles in closed areas may be allowed for certain reasons but must be approved by the authorized officer.

Similarly the National Forest System lands managed under the 1990 Wallowa-Whitman LRMP are designated as open, closed or limited use (by motor vehicle type, or season of use).

Reclamation's Owyhee Reservoir RMP restricts motor vehicle access to designated roads, parking areas, campgrounds, and other specific recreation areas (Reclamation 1994). GIS data were not obtained for OHV use on Reclamation-managed lands, but the Applicant's Proposed Action Alternative and other alternatives and route variations do not cross Reclamation-managed lands in areas closed to motorized travel.

Travel by snowmobiles is permitted in designated areas on BLM-managed and National Forest System lands (unless otherwise specifically limited or closed to snowmobiles) if they are operated in a responsible manner without damaging the vegetation or harming wildlife.

Non-motorized trails also occur in the study corridor and allow for users such as horseback riding, hiking, and mountain biking, as well as cross-country skiing in the winter months. Non-motorized trails tend to be in areas that allow the user to be in a natural setting with few human modifications.

Recreation Areas and Parks

Recreation areas and parks occur within the study corridor. These areas are federally, state, city, or privately managed for a variety of recreation activities, including camping, picnic site, etc.

BLM- and USFS-Designated Recreation Opportunity Spectrum Areas

ROS designations are used in the BLM Owyhee and SEORMPs and the Wallowa- Whitman National Forest LRMP to identify the level of a natural-appearing landscape, level of motorized use, and development level of structures that a recreationalist would expect to encounter on federal lands. The ROS management approach is used by the USFS (and in some BLM plans) to provide a variety of opportunities for recreationists through the allocation and planning of recreational resources, inventory of recreational resources, estimation of the consequences of management decisions on recreational opportunities, and matching experiences recreationists desire with available opportunities (Clark and Stankey 1979). The basic assumption underlying the ROS is that quality in outdoor recreation is best ensured through a diverse set of opportunities. The ROS consists of 7 major classes for recreation use: urban, rural, roaded natural, roaded modified semi-primitive non-motorized, semi-primitive motorized, and primitive. The ROS classes that are present within the study corridor are briefly described as follows (Clark and Stankey 1979):

Primitive—this class is an unmodified environment generally greater than 5,000 acres and generally located at least 3 miles from all roads and other motorized travel routes. A very low interaction among users (generally less than 3 group encounters per day) results in a very high probability of experiencing solitude, freedom, closeness to nature, tranquility, self- reliance, challenge, and risk. The evidence of other users is low. Restrictions and controls are not evident after entering the land unit. Motorized use is rare. Developments are not appropriate in areas classified as primitive.

Semi-Primitive Non-Motorized—This class is a natural or natural-appearing environment generally greater than 2,500 acres and generally located at least 0.5 mile (greater or fewer depending on the terrain and vegetation but not less than 0.25 miles) but not farther than 3 miles from all roads and other motorized travel routes. The concentration of users is low (generally less than 10 group encounters per day), but there is often evidence of other users. There is a high probability of experiencing solitude, freedom, closeness to nature, tranquility, self-reliance, challenge, and risk. There is a minimum of subtle, on-site controls. No roads are present in the area. Developments are not appropriate in areas classified as semi-primitive non-motorized.

Semi-Primitive Motorized—This class is a natural or natural-appearing environment generally greater than 2,500 acres and generally located within 0.5 mile of primitive roads and other motorized travel routes used by motor vehicles but not closer than 0.5 mile (greater or fewer depending on the terrain and vegetation but not less than 0.25 miles) from better-than- primitive roads and other motored travel routes. Developments may be evident but should be natural-appearing in areas designated as semi-primitive motorized, but should not dominate. The concentration of users is low (generally less than 10 group encounters per day), but there is often evidence of other users. There is a moderate probability of experiencing solitude, closeness to

nature, and tranquility along with a high degree of self-reliance, challenge, and risk in using motorized equipment. Local roads may be present, or there may be extensive boat traffic along shorelines.

Roaded Natural—Resource modification and use are evident in this predominantly naturally appearing environment generally occurring within 0.5 mile (greater or fewer depending on terrain and vegetation but not less than 0.25 miles) from better-than-primitive roads and other motorized travel routes. Roads and other motor vehicle developments are permitted when consistent with the recreation experience expected in the area. Developments may dominate the view in areas classified as roaded natural. Interactions among users may be moderate to high (generally less than 20 group encounters per day), with evidence of other users prevalent. There is an opportunity to affiliate with other users in developed sites, with some chance for privacy. Self- reliance on outdoor skills is only of moderate importance, with little opportunity for challenge and risk. Motorized use is allowed.

Roads and other developments would not be consistent with the primitive and semi- primitive non-motorized ROS designations.

Scenic Roads

There are a number of scenic roads within the study corridor. The scenic roads include scenic byways, backcountry byways, and a scenic tour route. The roads have been designated by federal or state agencies and are generally roads that have historic, recreational, scenic, or other qualities that make them attractive for recreationists and others interested in driving for pleasure. The locations of scenic byways and descriptions of visual effects are discussed in Section 3.2.12.

In addition to the byways above, the Lewis and Clark auto tour route also is within the study corridor. The Lewis and Clark National Historic Trail is approximately 3,700 miles long and connects 11 different states, with visitors able to follow the approximate route by using a variety of transportation methods and interpretative means (NPS 2013) The Oregon portion of the auto tour is within the study corridor. Refer to Section 3.2.15 for more information regarding the Lewis and Clark National Historic Trail and Auto Tour.

Special Recreation Management Areas and Extensive Resource Management Areas

The BLM designates SRMAs and ERMAs in RMPs. Recreation area management plans are developed for each SRMA and ERMA in accordance with BLM Manual 8322, *Recreation Area Management Plans* (BLM 2011).

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria were developed to assess the level of potential effects on recreation resources associated with implementation of the B2H Project (Table 3-369). The assessment of impacts was based on the

relationship between the level of a potential effect of each use to estimated disturbance associated with the B2H Project construction, operation, and maintenance. Criteria for assessing aesthetic impacts on views from recreation areas (i.e., day use areas, SRMAs, state parks) are described in Section 3.2.12.

Table 3-369. Criteria For Assessing Level of Recreation Impacts on Recreation Resources

Level of Impacts	Description
High	• Areas where the B2H Project would conflict physically with any designated recreation area (i.e., right-of-way crosses use area) • Areas where the B2H Project would conflict with any applicable adopted management prescription or goal of the affected land-managing agency (e.g., day use area)
Moderate	• Areas where the B2H Project would create an indirect conflict with a recreational use or designation (i.e., where new or improved access to a recreation use area would be created) • Areas where the transmission line would require expansion of an existing right-of-way in a designated recreation area
Low	• Areas where recreation area management prescription is compatible with a transmission line

Effects Analysis

Assessment of Initial Impacts

To determine initial impacts that could result from implementation of the B2H Project, the levels of potential effects on recreation resources were assessed based on the compatibility of the recreation resource with the B2H Project, as reflected in the criteria presented in Table 3-369.

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection that are part of the B2H Project description (Table 2-7); selective mitigation measures were developed to minimize adverse impacts on recreation resources. Below provides the selective mitigation measures applied to recreation resources.

- Selective Mitigation Measure 2: Use Existing Access and/or Crossing for Sensitive Resources Avoidance Applied would be implemented to reduce impacts on the recreation experience from new access to recreation areas
- Selective Mitigation Measure 6: Limit New or Improved Accessibility to Areas Previously Inaccessible would be applied to reduce impacts on recreation areas, especially areas with sensitive recreation resources (i.e., non-motorized trails, state parks)
- Selective Mitigation Measure 8: Span and/or Avoid Sensitive Features would be implemented to avoid a sensitive recreation sites such as day use areas, fishing access, trails, etc.
- Selective Mitigation Measure 10: Maximize Span at Crossing would be implemented to avoid sensitive recreation areas (i.e., day use areas, scenic byways, trails, etc.)

Residual Effects

Residual impacts are those impacts on recreation resources that would remain despite the design features of the B2H Project for environmental protection and after the implementation of the selective mitigation measures. Table 3-370 below summarizes the initial impacts on recreation resources, the

selective mitigation measures applied to mitigate potentially adverse effects on those resources; and the remaining residual impacts.

Table 3-370. Summary of Initial and Residual Impacts on Recreation Resources

Resource[1]	Initial Impacts	Selective Mitigation Measures Applied	Residual Impacts
Hunting Areas[2]	Moderate	6	Moderate
Recreation/Public Interest Site/State Parks	Moderate	2,8,10	Low
Trail	Low	2,8,10	Low
Scenic Highways/Byways/Backways	Low	2,8,10	Low

Table Notes:
[1]Only resources crossed by the alternative routes are listed in this table.
[2]Hunting areas as identified using data provided by IDPR, ODFW, Morrow County

Qualitative analysis was conducted to assess impacts on recreation relevant to ROSs, SRMAs, scenic byways, and OHV designations. This analysis considers how the B2H Project may affect the ability for the applicable agency to manage and maintain these areas. Visual effects on scenic byways from the B2H Project are addressed in Section 3.2.12.

Additional Analysis

No additional analysis was conducted for recreation resources.

3.2.8.5 Affected Environment

Segment 1—Morrow-Umatilla

Applicant's Proposed Action Alternative

The Blue Mountain Forest State Scenic Corridor day use area and Blue Mountain Crossing Sno Park; and recreational trails on USFS-administered lands are present in the Applicant's Proposed Action Alternative in the study corridor. Roaded natural and roaded modified ROS in the Wallowa-Whitman National Forest and the OHV designation open, which is managed by the BLM Baker Field Office, also are present in the study corridor (Links 1-71 through 1-75).

Variation S1-B1

Variation S1-B1 has the same recreation resources as the Applicant's Proposed Action Alternative in the study corridor.

Variation S1-B2

The Blue Mountain Crossing Sno Park, Blue Mountain Forest State Scenic Corridor day use area; Blue Mountain North/Grande Ronde River Basin Area, and the Oregon Trail Interpretative Park picnic area and trailhead (Link 1-75); and recreational trails on USFS-administered lands are present in the study corridor for Variation S1-B2. Roaded natural and roaded modified ROS in the Wallowa-Whitman National Forest also are present in the study corridor (Links 1-71 through 1-75). The OHV designation open, which is managed by the BLM Baker Field Office, also is present in the study corridor.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The additional action has 0.4 mile of the Oregon NHT within the study corridor, though most of this area is under agricultural production.

East of Bombing Range Road Alternative

The recreation resources within the study corridor for East Bombing Range Road Alternative are the same as those described for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

The recreation resources within the study corridor for Applicant's Proposed Action – Southern Route Alternative are the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The recreation resources within the study corridor for West of Bombing Range Road – Southern Route Alternative are the same as those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The affected environment for the additional action is the same as described for the additional action for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The Blue Mountain Forest State Scenic Corridor day use area, Blue Mountain Crossing Sno Park and recreational trails on USFS-administered lands are present in the Longhorn Alternative study corridor. Roaded natural ROS in the Wallowa-Whitman National Forest, and the OHV designation open, which is managed by the Baker Field Office, also are located in the study corridor (Links 1-71 through 1-75).

Interstate 84 Alternative

The recreation resources within the study corridor for Interstate 84 Alternative are the same as those described for the Applicant's Proposed Action Alternative.

Variation S1-A1

Variation S1-A1 has recreational trails on USFS-administered lands in the study corridor.

Variation S1-A2

Variation S1-A2 has recreational trails USFS-administered lands in the study corridor.

Interstate 84 – Southern Route Alternative

The recreation resources within the study corridor for Interstate 84 – Southern Route Alternative are similar to those described for the Applicant's Proposed Action Alternative.

SEGMENT 2—BLUE MOUNTAINS

Applicant's Proposed Action

The Hilgard Junction State Park (Link 2-15), Grand Tour Route scenic bikeway (Link 2-1), Blue Mountain Snow-Park, recreational trails on USFS-administered lands, roaded natural and roaded modified ROS in the Wallowa-Whitman National Forest, and the OHV designation open, which is managed by the BLM Baker Field Office are located within the Applicant's Proposed Action Alternative study corridor.

Variation S2-A1

Similar to the Applicant's Proposed Action Alternative, the Blue Mountain Crossing Snow-Park, Hilgard Junction State Park (Link 2-15), roaded natural and roaded modified ROS in the Wallowa-Whitman National Forest are located in Variation S2-A1 study corridor.

Variation S2-A2

Similar to the Applicant's Proposed Action Alternative, the Blue Mountain Crossing Snow-Park, Hilgard Junction State Park (Link 2-15), recreational trails on USFS-administered lands and roaded natural and roaded modified ROS in the Wallowa-Whitman National Forest are located in the Variation S2-A2 study corridor.

Variation S2-B1

Similar to Variation S2-A2, recreational trails on BLM-administered lands and the OHV designation open, which is managed by the BLM Baker Field Office are located in the Variation S2-B1 study corridor.

Variation S2-B2

Variation S2-B2 has no recreation resources in the study corridor.

Variation S2-C1

Variation S2-C1 has no recreation resources in the study corridor.

Variation S2-C2

The Glass Hills hunting area (Link 2-12) and unknown trails Comment on BLM-administered lands are present within the study corridor for Variation S2-C2. Additionally, the Morgan Lake Recreation Area (Link 2-45) is in the study corridor for this variation. Morgan Lake Recreation Area offers lake fishing, picnicking, hiking, swimming, camping and non-motorized boating, with up to 25,000 rainbow trout stocked annually in the lake. Paved paths and walkways are provided to accommodate wheelchair access. This area is funded through grants from the Oregon Department of Fish and Wildlife and the Wildhorse Foundation, and is maintained with the help of volunteers. (City of LaGrande 2016)

Variations S2-E1 and S2-E2

Variations S2-E1 and S2-E2 have no recreation resources in the study corridor.

Variations S2-F1 and S2-F2

The Grand Tour Route scenic bikeway scenic byway (Link 2-1) trails on BLM-administered lands, and the OHV designation limited, which is managed by BLM Baker Field Office are located in the study corridor of Variations S2-F1 and S2-F2.

Glass Hill Alternative

The Grand Tour Route scenic bikeway (Link 2-1), recreational trails on BLM-administered lands, roaded natural and roaded modified ROS category in the Wallowa-Whitman National Forest, and the OHV designations open and limited, which are managed by the BLM Baker Field Office are located in the Glass Hill Alternative study corridor.

Variations S2-D1 and S2-D2

Variations S2-D1 and S2-D2 have no recreation resources in the study corridor.

Mill Creek Alternative

Hilgard Junction State Park (Link 2-15), Blue Mountain Crossing Sno Park, Grand Tour Route scenic bikeway (Link 2-1), Glass Hill hunting access area (Link 2-12), recreational trails on BLM-administered lands; roaded natural and roaded modified ROS category in the Wallowa-Whitman National Forest; and the OHV designations open and limited, which are managed by the BLM Baker Field Office are located in the Mill Creek Alternative study corridor.

SEGMENT 3—BAKER VALLEY

Applicant's Proposed Action

The National Historic Oregon Trail Interpretive Center visitor center (Link 3-36); M.R. King Ranches and Troy Ranches hunting access areas (Link 3-54) trails on BLM-administered lands; and the OHV designation open, which is on lands managed by the BLM Baker Field Office are located in the Applicant's Proposed Action study corridor.

The National Historic Oregon Trail Interpretive Center was a recreation destination for more than 66,000 people in 2009, accounting for 26 percent of the recreation users in the Baker Field Office. This interpretive site on the Oregon Trail, as of 2009, had recorded nearly two million visitors. While the number of visitors fluctuates, they do seem to be rising as people continue to seek out recreational opportunities. The site hosts events, education programs, exhibits, 4 miles of interpretive trails, a theatre, and gift shop, among other facilities. As part of its mission statement it lists, "preserving and protecting its historic, cultural heritage, natural, and visual features." For more information on the NHOTIC, refer to Section 3.2.15 and 3.2.17 (BLM 2011; BLM n.d)

Variations S3-A1 and S3-A2

The OHV designation open, which is on lands managed by the BLM Baker Field Office are present in Variations S3-A1 and S3-A2.

Variation S3-B1

The National Historic Oregon Trail Interpretive site visitor center (Link 3-36); National Virtue Flat OHV ERMA (Link 3-28) and NHOTIC SRMA; and the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Variation S3-B1 study corridor.

Variation S3-B2

Similar to Variation S3-B1, the National Historic Oregon Trail Interpretive site visitor center (Link 3-36);NHOTIC SRMA; and the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office, are present in the Variation S3-B2 has study corridor.

Variation S3-B3

The National Historic Oregon Trail Interpretive site visitor center (Link 3-36)and the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Variation S3-B3 study corridor.

Variation S3-B4

Recreation resources in the Variation S3-B4 study corridor are the same as those described for Variation S3-B3.

Variation S3-B5

Recreation resources in the Variation S3-B5 study corridor are the same as those described for Variation S3-B3.

Variation S3-C1

The M.R. King Ranches and Troy Ranches hunting access areas (Link 3-54), the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Variation S3-C1 study corridor.

Variation S3-C2

The M.R. King Ranches and Troy Ranches hunting access areas (Link 3-54); the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Variation S3-C2 study corridor.

Variations S3-C3 through S3-C6

The M.R. King Ranches, Fur Mountain, and Troy Ranches hunting access areas; the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Variation S3-C3 study corridor

Flagstaff A Alternative

The National Historic Oregon Trail Interpretive Center visitor center (Link 3-36); M.R. King Ranches and Troy Ranches hunting access areas (Link 3-54); the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Flagstaff A Alternative study corridor

Timber Canyon Alternative

The OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Timber Canyon Alternative study corridor

Flagstaff A – Burnt River Mountain Alternative

The National Historic Oregon Trail Interpretive Center visitor center (Link 3-36); M.R. King Ranches, Fur Mountain (Link 3-73), and Troy Ranches hunting access areas (Link 3-54); the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Flagstaff A – Burnt River Mountain Alternative study corridor

Flagstaff B Alternative

The National Historic Oregon Trail Interpretive Center visitor center (Link 3-36); M.R. King Ranches and Troy Ranches hunting access areas (Link 3-54); the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Flagstaff B Alternative study corridor

Flagstaff B – Burnt River West Alternative

The National Historic Oregon Trail Interpretive Center visitor center (Link 3-36); M.R. King Ranches, Fur Mountain (Link 3-73), and Troy Ranches hunting access areas (Link 3-54); the OHV designations open and limited, which are on lands managed by the BLM Baker Field Office are present in the Flagstaff B-Burnt River West Alternative study corridor

Flagstaff B – Durkee Alternative

Recreation resources in the Flagstaff B – Durkee Alternative study corridor are the same as those described for the Flagstaff B – Burnt River West Alternative.

SEGMENT 4—BROGAN

Applicant's Proposed Action

The roaded natural, rural, semi-primitive motorized, and semi-primitive non-motorized ROS managed by the Malheur Field Office; the OHV designation open, which is on lands managed by the BLM Baker and Malheur Field Offices are present in the Applicant's Proposed Action Alternative study corridor

Variation S4-A1

The and the OHV designation open, which is on lands managed by the BLM Baker Field Office are present in the Variation S4-A1 study corridor

Variation S4-A2

Recreation resources in the Variation S4-A2 study corridor are the same as those described for Variation S4-A1.

Variation S4-A3

Recreation Resources in the Variation S4-A3 study corridor are the same as those described for Variation S4-A1.

Tub Mountain South Alternative

The Birch Creek interpretative site (Link 4-75); ROS managed by the Malheur Field Office, and the OHV designation open, which is on lands managed by the BLM Baker Field Office and the OHV designations open and limited, which are on lands managed by the BLM Malheur Field Office are present in the Tub Mountain South Alternative study corridor

Willow Creek Alternative

ROS managed by the Malheur Field Office; and the OHV designation open, which is on lands managed by the BLM Baker Field Office and the OHV designations open and limited, which are on lands managed by the BLM Malheur Field Office are present in the Willow Creek Alternative study corridor

SEGMENT 5—MALHEUR

Applicant's Proposed Action Alternative

ROS managed by the Malheur Field Office; Owyhee River Below the Dam SRMA (Link 5-30); and the OHV designations open and limited, which are on lands managed by the BLM Malheur Field Office are present in the Applicant's Proposed Action study corridor

Variations S5-A1 and S5-A2

ROS managed by the Malheur Field Office; and the OHV designation open, and limited, which are on lands managed by the BLM Malheur Field Office are present in Variations S5-A1 and S5-A2

Variation S5-B1

Recreation resources in the Variation S5-B1 study corridor are the same as those discussed for the Applicant's Proposed Action Alternative.

Variation S5-B2

ROS managed by the Malheur Field Office; Owyhee River Below the Dam SRMA (Link 5-30); and the OHV designations open and limited, which are on lands managed by the BLM Malheur Field Office are present in the Variation S5-B2 study corridor

Malheur S Alternative

ROS managed by the Malheur Field Office; and the OHV designations open and limited, which are on lands managed by the BLM Malheur Field Office are present in the Malheur S Alternative study corridor

Malheur A Alternative

ROS managed by the Malheur Field Office; and the OHV designations open and limited, which are on lands managed by the BLM Malheur Field Office are present in the Malheur A Alternative study corridor

SEGMENT 6—TREASURE VALLEY

Applicant's Proposed Action

ROS managed by the Owyhee and Malheur Field Offices; and the OHV designations open and limited, which are on lands managed by the BLM Malheur Field Office and the OHV designation limited to existing and limited to designated, which are on lands managed by the BLM Owyhee Field Office are present in the Applicant's Proposed Action Alternative study corridor

Variation S6-A1

ROS managed by the Owyhee and Malheur Field Offices; and the OHV designation limited, which is on lands managed by the BLM Malheur Field Office and the OHV designations limited to existing and limited to designated, which are on lands managed by the BLM Owyhee Field Office are present in the Variation S6-A1 study corridor

Variation S6-A2

Recreation resources in the Variation S6-A2 study corridor are the same as those described for Variation S6-A1.

Variation S6-B1

ROS managed by the Owyhee Field Office; and the OHV designations limited to existing and limited to designated, which are on lands managed by the BLM Owyhee Field Office are present in the Variation S6-B1 study corridor

Variation S6-B2

The Jump Creek recreation site (Link 6-20); ROS managed by the Owyhee Field Office; and the OHV designations closed, limited to existing, and limited to designated, which are on lands managed by the BLM Owyhee Field Office are present in the Variation S6-B2 study corridor

3.2.8.6 ENVIRONMENTAL CONSEQUENCES (RESULTS OF ANALYSIS)

This section presents the results of the effects analysis for recreational resources. Refer also to MV-19.

TYPES OF POTENTIAL EFFECTS

Both direct and indirect effects on recreation resources could result from construction, operation, and maintenance of the B2H Project. Direct effects associated with construction, operation, and maintenance activities could include:

- Trail and scenic byway closures during construction (short term)
- Increased access into areas not suitable for vehicular travel as a result of new access roads constructed for the B2H Project (long term)
- Limited opportunity for future expansion of recreation sites (long term)

- Potential diminished recreational experience at campgrounds, trails, and other recreation areas as a result of the sights, sounds (e.g., corona effect), and presence of the transmission line and access roads (long term)

Indirect effects on recreation resources can result from increased traffic on roads leading to recreation areas during construction (short term).

NO ACTION ALTERNATIVE

Under this alternative, the environment would remain as it presently exists.

EFFECTS COMMON TO ALL ALTERNATIVES

Potential impacts on recreation related to geotechnical investigation activities would be largely avoided through implementation of design features of the B2H Project for environmental protection (refer to Table 2-7). Recreational sites would be avoided. Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on recreation would be low. Geotechnical testing would be coordinated with the managing agency. Overland travel in recreation areas would be avoided unless approved by the managing agency.

SEGMENT 1—MORROW-UMATILLA

Table 3-371 presents the results of the effects analysis for the alternatives and route variations in Segment 1.

Table 3-371. Recreation Inventory Data and Residual Impacts in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)[1]		
		Hunting Areas	Scenic Byways	Recreation Areas/State Park	Recreation Management Areas	Trails	High	Moderate	Low
Applicant's Proposed Action	91.9	0.0	0.0	0.3	0.0	3.0	0.0	0.3	2.9
Variation S1-B1	6.4	*0.0*	*0.0*	*0.3*	*0.0*	*2.3*	*0.0*	*0.3*	*2.2*
Variation S1-B2	6.4	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	0.0	0.3	0.0	3.1	0.0	0.3	3.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	0.3	0.0	3.0	0.0	0.3	2.9
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	0.3	0.0	3.0	0.0	0.3	2.9
Longhorn	88.2	0.0	0.0	0.3	0.0	2.8	0.0	0.3	2.7

Table 3-371. Recreation Inventory Data and Residual Impacts in Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)[1]		
		Hunting Areas	Scenic Byways	Recreation Areas/State Park	Recreation Management Areas	Trails	High	Moderate	Low
Interstate 84	84.7	0.0	0.0	0.3	0.0	24.3	0.0	0.3	24.2
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*14.0*	*0.0*	*0.0*	*14.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.1*
Interstate 84 – Southern Route	93.4	0.0	0.0	0.3	0.0	24.3	0.0	0.3	24.2

Table Notes:
[1]Combined results of overall residual impacts may not sum due to overlapping impact locations.
[2]Hunting areas as identified using data provided by IDPR, ODFW, and Morrow County

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 0.3 mile of moderate residual impacts on recreation resources where the B2H Project would cross the Blue Mountain Forest State Scenic Corridor day use area (MV-19). To minimize potential effects, new access roads to the day use area would be prohibited (Selective Mitigation Measure 6) and towers structures would be placed to avoid directly affecting the facilities at the day use area that visitors use to view and photograph wildlife (Selective Mitigation Measure 8). Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting wildlife viewers and wildlife photographers. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects. Refer to Section 3.2.12 for a discussion of visual effects on Blue Mountain Forest State Scenic Corridor day use area.

Impacts of the B2H Project on other recreational resources, including recreational trails, a small portion of the open OHV designation, which is managed by the Baker Field Office, and roaded natural ROS that are crossed, would be low. Long-term effects on the management of recreational trails, the open OHV designation, and roaded natural ROS categories are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Variation S1-B1

The impacts associated with Variation S1-B1 would be the same as the Applicant's Proposed Action Alternative.

Variation S1-B2

Variation S1-B2 avoids the Blue Mountain Forest State Scenic Corridor day use area, recreational trails, and the open OHV designation, which is managed by the BLM Baker Field Office. No high or

moderate residual impacts on recreation resources would occur for this Variation. Effects of the Variation S1-B2 on the roaded natural ROS would be low. Long-term effects on the management of ROS categories are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment in the ROS categories.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

This additional action would not result in any high or moderate residual impacts on recreation resources.

East of Bombing Range Road Alternative

The effects on the Blue Mountain Forest State Scenic Corridor day use area associated with East of Bombing Range Road Alternative would be the same as the Applicant's Proposed Action Alternative. Impacts of the East of Bombing Range Road Alternative on other recreational resources crossed, including recreational trails, a small portion of the open OHV designation, and the roaded natural ROS, would be similar to the Applicant's Proposed Action Alternative. The East of Bombing Range Road Alternative crosses 0.1 more miles of trails. Long-term effects on the management of the recreational trails, the small portion of the open OHV designation, and the roaded natural ROS are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Applicant's Proposed Action – Southern Route Alternative

The effects on the Blue Mountain Forest State Scenic Corridor day use area associated with the Applicant's Proposed Action – Southern Route Alternative would be the same as the Applicant's Proposed Action Alternative. Impacts of the Applicant's Proposed Action – Southern Route Alternative on other recreational resources crossed, including recreational trails, a small portion of the open OHV designation, and the roaded natural ROS, would be similar to the Applicant's Proposed Action Alternative. A larger portion of the open OHV designation would be affected but impacts would be low. Long-term effects on the management of the recreational trails, the small portion of the open OHV designation, and the roaded natural ROS are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The effects on recreation resources from this design option would be the same as described for the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

The effects on the Blue Mountain Forest State Scenic Corridor day use area associated with the West of Bombing Range Road – Southern Route Alternative would be the same as the Applicant's Proposed Action Alternative. Impacts of the West of Bombing Range Road – Southern Route Alternative on other recreational resources crossed, including recreational trails, a small portion of the open OHV designation, and roaded natural ROS, would be similar to the Applicant's Proposed Action Alternative. A larger portion of the open OHV designation would be affected but impacts would be low. Long-term effects on the management of the recreational trails, the small portion of the open OHV designation, and the roaded natural ROS are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The effects on recreation resources from this design option would be the same as described for the Applicant's Proposed Action Alternative.

Longhorn Alternative

The effects on the Blue Mountain Forest State Scenic Corridor day use area associated with the Longhorn Alternative would be the same as the Applicant's Proposed Action Alternative. Impacts of the Longhorn Alternative on other recreational resources crossed, including recreational trails, a small portion of the open OHV designation, and the roaded natural ROS, would be similar to the Applicant's Proposed Action Alternative. More recreational trails and a larger portion of the open OHV designation would be affected but impacts would be low. Long-term effects on the management of the recreational trails, the open OHV designation, and the roaded natural ROS are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Interstate 84 Alternative

The Interstate – 84 Alternative has the same recreation resources as the Applicant's Proposed Action Alternative, including Blue Mountain Forest State Scenic Corridor day use area (Link 1-31) and recreational trails on USFS-administered lands in the study corridor. This alternative route also has roaded natural ROS. Impacts of the Interstate 84 Alternative on other recreational resources crossed, including recreational trails, a small portion of an open OHV designation, and the roaded natural ROS, would be similar to the Applicant's Proposed Action Alternative. More recreational trails and open OHV designation would be affected but impacts would be low. Long-term effects on the management of the recreational trails, the open OHV designation, and the roaded natural ROS are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Variations S1-A1 and S1-A2

Variations S1-A1 and S1-A2 have no high or moderate residual impacts on recreation resources. Impacts on recreational trails can be mitigated resulting in impacts as low. Long-term effects on the management of the recreational trails are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Interstate 84 – Southern Route Alternative

The effects on the Blue Mountain Forest State Scenic Corridor day use area associated with the Interstate 84 – Southern Route Alternative would be similar to the Applicant's Proposed Action Alternative. However, the Blue Mountain Forest State Scenic Corridor day use area is crossed farther east (Link 1-31). Impacts of the Interstate 84 – Southern Route Alternative on other recreational resources, including recreational trails, a small portion of the OHV designation crossed, and the roaded natural ROS, would be similar to the Applicant's Proposed Action Alternative. More recreational trails and a larger portion of the open OHV designation would be affected but impacts would be low. Long-term effects on the management of these recreation resources are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these recreation resources.

Conclusions

All alternative routes and route variations except for Variation S1-B1, Variation S1-A1, and Variation S1-A2 would result in moderate impacts on the Blue Mountain Forest State Corridor day use area. All other impacts on recreation resources are expected to be low. Interstate 84, and Interstate 84 – Southern Route Alternative crosses more recreational trails and a larger portion of the open OHV designation than the other alternative routes and route variations analyzed in Segment 1.

SEGMENT 2—BLUE MOUNTAINS

Table 3-372 presents the residual impacts on all alternative routes and route variations in Segment 2.

Table 3-372. Recreation Inventory Data and Residual Impacts in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)[1]		
		Hunting Areas	Scenic Byways	Recreation Areas/State Park	Recreation Management Areas	Trails	High	Moderate	Low
Applicant's Proposed Action	33.8	0.0	0.2	0.0	0.0	0.8	0.0	0.0	1.0
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.1*

Table 3-372. Recreation Inventory Data and Residual Impacts in Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)[1]		
		Hunting Areas	Scenic Byways	Recreation Areas/State Park	Recreation Management Areas	Trails	High	Moderate	Low
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.2*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.8*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.8*	*0.4*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.2*	*0.0*	*0.0*	*0.4*	*0.0*	*0.0*	*0.6*
Variation S2-F2	*12.2*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*
Glass Hill	33.7	0.0	0.2	0.0	0.0	0.8	0.0	0.0	1.0
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	1.4	0.2	0.0	0.0	0.8	0.0	1.4	1.0

Table Notes:
[1]Combined results of overall residual impacts may not sum due to overlapping impact locations.
[2]Hunting areas as identified using data provided by IDPR, ODFW, and Morrow County

Applicant's Proposed Action

The Applicant's Proposed Action Alternative would result in no high or moderate residual impacts on recreation resources but low impacts would occur where the alternative crosses the Grand Tour Route scenic bikeway (Link 2-1) and recreational trails. To minimize potential effects on these recreation areas, the use of existing access and avoiding directly affecting the scenic bikeway and recreational trails (Selective Mitigation Measure 2), towers structures would be placed to avoid directly affecting the recreational trails and scenic bikeway (Selective Mitigation Measure 8), and maximize the span over these areas (Selective Mitigation Measure 10). Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the trails or scenic byway and noise and construction activities disrupting bicycle and other trail users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects. Refer to Section 3.2.12 for a discussion of visual effects on Grand Tour Route scenic bikeway.

Variation S2-A1

Variation S2-A1 has no high, moderate, or low residual impacts on recreation resources. Effects of the Variation S2-A1 on the roaded natural ROS would be low. Long-term effects on the management of ROS categories are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment in the ROS categories.

Variation S2-A2

Variation S2-A2 would result in no high or moderate residual impacts on recreation resources but low impacts would occur where the B2H Project crosses recreational trails. To minimize potential effects on these recreational trails, the use of existing access and avoiding directly affecting the recreational trails (Selective Mitigation Measure 2), towers structures would be placed to avoid directly affecting the recreational trails (Selective Mitigation Measure 8), and maximize the span over these recreational areas (Selective Mitigation Measure 10). Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the trails and noise and construction activities disrupting bicycle, snowmobiling, and other trail users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line. Impacts on a small portion of roaded natural ROS can be mitigated and would not preclude the B2H Project.

Variation S2-B1

There are no high or moderate impacts on Variation S2-B1. Effects on recreational trails would be similar to Variation S2-A2 and the open OHV designation would be affected but impacts would be low. Long-term effects on the management of the open OHV designation are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of this open OHV designation.

Variation S2-B2

Variation S2-B2 has no high, moderate, or low residual impacts on recreation resources.

Variation S2-C1

Variation S1-C1 has no high, moderate, or low residual impacts on recreation resources.

Variation S2-C2

Variation S2-C2 would result in no high impacts and 0.8 mile of moderate residual impacts on hunting access areas (Link 2-48). To minimize potential effects on hunting access areas, existing access will be used (Selective Mitigation Measure 2), limit new or improved accessibility to previously inaccessible areas would be applied to reduce impacts on hunting access areas (Selective Mitigation Measure 6), towers structures would be placed to avoid directly affecting the hunting area access points (Selective Mitigation Measure 8), and to maximize the span over hunting area access points (Selective Mitigation Measure 10). Recreational trails also are crossed by Variation S2-C2 and effects would be mitigated similar to the Applicant's Proposed Alternative.

Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the hunting areas and noise and construction activities disrupting hunting activities. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line.

Indirect effects could occur on the Morgan Lake Recreation Area (Link 2-45). Although this variation does not cross the recreation area, it is approximately 108 feet away from the recreation area at the closest point. This could detract from the recreational experience of users in the area by introducing noise and dust associated with construction activities. In addition, this variation is close to the entrance of the recreation area, which could inhibit or limit access during construction. For the long term, presence of B2H Project permanent facilities could reduce the recreational experience through introduction of development in a natural setting. For further discussion of impacts on visual resources, refer to Section 3.2.12.

Variations S2-E1 and S2-E2

Variations S2-E1 and S2-E2 have no high, moderate, or low residual impacts on recreation resources.

Variation S2-F1

Variation S2-F1 would have no high or moderate residual impacts. Low residual impacts would occur where this route variation crosses Grand Tour Scenic Bikeway and recreational trails. Impacts and the selective mitigation measures applied to the Grand Tour Scenic Bikeway and recreational trails would be the same as the Applicant's Proposed Alternative. A limited OHV designation managed by the BLM would be affected but impacts would be low. Long-term effects on the management of the limited OHV designation are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of this limited OHV designation.

Variation S2-F2

Variation S2-F2 would have no high or moderate residual impacts. Low residual impacts would occur where this route variation crosses Grand Tour Scenic Bikeway. Impacts and the selective mitigation measures applied to the Grand Tour Scenic Bikeway would be the same as the Applicant's Proposed Alternative.

Glass Hill Alternative

The Glass Hill Alternative would have no high or moderate residual impacts. Low residual impacts would occur where the Glass Hill Alternative crosses Grand Tour Scenic Bikeway and recreational trails. Impacts and the selective mitigation measures applied to the Grand Tour Scenic Bikeway and recreational trails would be the same as the Applicant's Proposed Alternative. Open and limited OHV designations and a roaded natural ROS area would be affected but impacts would be low. Long-term effects on the management of the open and limited OHV designations and roaded natural ROS area are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these open and limited OHV designations and roaded natural ROS.

Variations S2-D1 and S2-D2

Variations S2-D1 and S2-D2 have no high, moderate, or low residual impacts on recreation resources.

Mill Creek Alternative

The Mill Creek Alternative would have 1.4 miles moderate residual impacts where the B2H Project crosses a hunting access area (Link 2-12) and no high impacts. Low residual impacts would occur where the B2H Project crosses Grand Tour Scenic Bikeway and recreational trails. Impacts and the selective mitigation measures applied to the hunting access area would be similar to Variation S2-C2 and Grand Tour Scenic Bikeway and recreational trails would be the same as the Applicant's Proposed Alternative. In addition to these recreation areas a roaded natural ROS area would be affected but impacts would be low. Long-term effects on the management of the roaded natural ROS area are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of this roaded natural ROS area.

Conclusions

Moderate impacts on hunting areas are expected from Variation S2-C2 (0.8 mile) of the Applicant's Proposed Action Alternative and the Millcreek Alternative (1.4 miles). No high or moderate impacts on recreation resources are expected from other alternatives routes or route variations analyzed in Segment 2.

SEGMENT 3—BAKER VALLEY

Table 3-373 presents the residual impacts on all alternative routes and route variations in Segment 3.

Table 3-373. Recreation Inventory Data and Residual Impacts in Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)[1, 2]		
		Hunting Areas[3]	Scenic Byways	Recreation Areas/State Park	Recreation Management Areas	Trails	High	Moderate	Low
Applicant's Proposed Action	55.2	*6.3*	*0.7*	*0.0*	*0.1*	*2.1*	*0.0*	*6.3*	*2.0*
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.5*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.5*
Variation S3-B2	*14.4*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S3-B3	*14.7*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S3-B4	*14.3*	*0.0*	*0.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*
Variation S3-B5	*14.0*	*0.0*	*0.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*
Variation S3-C1	*21.1*	*2.6*	*0.2*	*0.0*	*0.0*	*1.8*	*0.0*	*2.6*	*1.5*
Variation S3-C2	*21.7*	*3.7*	*0.2*	*0.0*	*0.0*	*1.0*	*0.0*	*3.7*	*0.7*
Variation S3-C3	*21.1*	*3.9*	*0.2*	*0.0*	*3.0*	*0.8*	*0.0*	*3.9*	*0.5*
Variation S3-C4	*21.4*	*3.9*	*0.2*	*0.0*	*3.3*	*0.8*	*0.0*	*3.9*	*0.5*
Variation S3-C5	*21.0*	*5.2*	*0.1*	*0.0*	*3.9*	*1.1*	*0.0*	*5.2*	*0.7*
Variation S3-C6	*24.7*	*2.5*	*0.3*	*0.0*	*4.4*	*1.0*	*0.0*	*2.5*	*0.8*
Flagstaff A	55.3	6.3	0.5	0.0	0.0	2.1	0.0	6.3	1.8
Timber Canyon	70.3	0.0	1.0	0.0	0.0	2.0	0.0	0.0	3.0

Table 3-373. Recreation Inventory Data and Residual Impacts in Segment 3—Baker Valley									
Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)[1, 2]		
		Hunting Areas[3]	Scenic Byways	Recreation Areas/State Park	Recreation Management Areas	Trails	High	Moderate	Low
Flagstaff A – Burnt River Mountain	55.3	7.6	0.5	0.0	3.0	1.1	0.0	7.6	0.8
Flagstaff B	56.0	6.3	0.6	0.0	0.0	2.1	0.0	6.3	1.9
Flagstaff B – Burnt River West	55.7	8.9	0.5	0.0	3.9	1.4	0.0	8.9	1.1
Flagstaff B - Durkee	59.6	6.2	0.7	0.0	4.4	1.3	0.0	6.2	1.2

Table Notes:
[1]Residual impacts do not include miles crossed for Recreation Management Areas.
[2]Combined results of overall residual impacts may not sum due to overlapping impact locations.
[3]Hunting areas as identified using data provided by IDPR, ODFW, and Morrow County

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative would result in 6.3 miles of moderate residual impacts where the Applicant's Proposed Action crosses hunting access areas and 2.0 miles of low impacts where the Applicant's Proposed Action crosses the Grand Tour Scenic Bikeway, Snake River-Mormon Basin back country byway, Hells Canyon (an All-American road) and recreational trails (MV-19). To minimize potential effects on hunting access areas, existing access will be used (Selective Mitigation Measure 2), new access roads to the hunting access areas would be limited to only where it is necessary, and would be reclaimed following construction (Selective Mitigation Measure 6), towers structures would be placed to avoid directly affecting the hunting area access points (Selective Mitigation Measure 8), and maximize the span over hunting area access points (Selective Mitigation Measure 10).

The Applicant's Proposed Action also crosses Virtue Flat OHV ERMA (0.1 mile) (Link 3-28), an extensive OHV designated-use area managed for all year-round uses, including mountain bikes and horseback riding. Short-term effects from construction activities to the scenic byways, recreational trails, ERMA, and open and limited OHV designations include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting hunters and byway, OHV and/or trail users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

The Applicant's Proposed Action Alternative passes to the east of the NHOTIC in a location that could affect the recreation experience of visitors to the site, although no NHOTIC trails or interpretive sites would be crossed by the B2H Project. Some users of the site visit the NHOTIC for the purpose of experiencing the Oregon Trail as it previously existed. The presence of the B2H Project could affect this experience in the short term through construction activities (noise and dust of equipment, potential limited access). In the long term, through the presence of permanent access roads, removal of

vegetation, and tower structures, which could alter the landscape setting, the vicarious recreation experience some visitors seek at the NHOTIC could be affected. However, there are existing disturbances, including roads, agriculture, and a transmission line already affecting this experience. The additional disturbance could affect the types or quantity of users at the NHOTIC. Economic benefits associated with tourism and recreation may decrease if visitation decreases. Refer to Section 3.2.17 for further discussion regarding socioeconomics. For more information related to impacts on the NHOTIC, also refer to Section 3.2.15.

Variations S3-A1 and S3-A2

Variations S3-A1 and S3-A2 have no high, moderate, or low residual impacts on recreation resources. A limited OHV designation would be affected but impacts would be low. Long-term effects on the management of the limited OHV designation are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of this limited OHV designation.

Variation S3-B1

Variation S3-B1 would result in no high or moderate residual impacts and 0.5 mile of low impacts where Variation S3-B1 crosses Grand Tour Scenic Bikeway, Snake River-Mormon Basin back country byway, and Hells Canyon (an All-American road), (MV-19). To minimize potential effects on the scenic byways, existing access will be used (Selective Mitigation Measure 2), towers structures would be placed to avoid directly affecting the scenic byways (Selective Mitigation Measure 8), and maximize the span over the scenic byways (Selective Mitigation Measure 10).

In addition, the Variation S3-B1 crosses the Virtue Flat OHV ERMA (0.1 mile) (Link 3-28), an extensive OHV designated-use area managed for all year-round uses, including mountain bikes and horseback riding, and a limited OHV designation. Short-term effects from construction activities to the scenic byways, ERMA, and limited OHV designation include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting byway, OHV and/or trail users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

This variation shares the same alignment as the Applicant's Proposed Action and recreation impacts on the NHOTIC would be the same as that alternative.

Variation S3-B2

Variation S3-B2 has no high or moderate residual impacts and 0.4 mile of low impacts where Variation S3-B2 crosses the same scenic byways and limited OHV designations as Variation S3-B1, however this variation also crosses open OHV designation. Effects on recreation resources would be similar to those described for Variation S3-B1. This variation is on the western side of the NHOTIC while Variation S3-B1 is on the eastern side of the NHOTIC. Neither variation directly affects trails or recreation sites at the NHOTIC, but the view shed of recreationists at the NHOTIC would be affected.

Variation S3-B3

Variation S3-B3 has no high or moderate residual impacts and 0.3 mile of low impacts where Variation S3-B3 crosses scenic byways. Effects on recreation resources would be similar to those described for Variation S3-B1, with the exception that no limited OHV designation is crossed by this variation. This variation passes the NHOTIC using the same alignment as Variation S3-B2 and impacts on recreation at the NHOTIC would be the same.

Variation S3-B4

Variation S3-B4 has no high or moderate residual impacts and 0.3 mile of low impacts where Variation S3-B4 crosses scenic byways. Effects on recreation resources would be the same as those described for Variation S3-B1. This variation passes the NHOTIC further away than Variation S3-B2 and, thus, impacts on recreation would be less than that variation.

Variation S3-B5

Variation S3-B5 has no high or moderate residual impacts and 0.3 mile of low impacts where Variation S3-B4 crosses scenic byways. In addition, Variation S3-B5 crosses an open OHV designation. Effects on recreation resources would be the same as those described for Variation S3-B1. This variation passes the NHOTIC slightly further away than Variation S3-B4 and would likely have the least impacts on recreation at the NHOTIC of these variations on the west side of the NHOTIC.

Variation S3-C1

Variation S3-C1 would result in 2.6 miles of moderate residual impacts on recreation resources where the Variation S3-C1 crosses hunting access areas and 1.5 miles of low impacts where Variation S3-C1 crosses the Snake River-Mormon Basin back country byway and recreational trails (MV-19). To minimize potential effects on hunting access areas, existing access will be used (Selective Mitigation Measure 2), new access roads to the hunting areas would be limited, and where they are necessary, they would be reclaimed to original condition so that additional access to the hunting area would be limited to during construction only (Selective Mitigation Measure 6), towers structures would be placed to avoid directly affecting the hunting area access points (Selective Mitigation Measure 8), and maximize the span over hunting area access points (Selective Mitigation Measure 10). In addition to the recreation resources listed above, Variation S3-C1 also crosses open and limited OHV designations. Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting hunters, byway, and/or OHV users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

Variation S3-C2

Similar to Variation S3-C1, Variation S3-C2 would result in 3.7 miles of moderate impacts from crossing hunting access areas. This variation also would have 0.7 mile of low impacts where the Variation S3-C2 crosses the Snake River-Mormon Basin back country byway and recreational trails. To minimize potential effects on hunting access areas, Snake River-Mormon Basin back country byway, and recreational trails, existing access will be used (Selective Mitigation Measure 2), new access roads to

the hunting access areas would be prohibited (Selective Mitigation Measure 6), towers structures would be placed to avoid directly affecting the hunting access area, Snake River-Mormon Basin back country byway and recreational trail access points (Selective Mitigation Measure 8), and maximize the span over hunting access areas, Snake River-Mormon Basin back country byway points, and recreational trails (Selective Mitigation Measure 10). In addition, Variation S3-C2 also crosses open and limited OHV designations. Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting hunters, byway users, and/or OHV users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

Variation S3-C3

Variation S3-C3 would result in no high impacts and 3.9 miles of moderate impacts from crossing hunting access areas and 0.5 mile of low impacts where Variation S3-C3 crosses the Snake River-Mormon Basin back country byway and recreational trails. Refer to Variation S3-C2 for further information regarding mitigation and effects on these recreation resources. In addition, Variation S3-C3 also crosses Burnt River ERMA (3.0 miles) which is managed for water-based activities, including fishing and hunting, and limited and open OHV designations. Short-term effects from construction activities would include temporary disturbance, restriction or closure of areas where OHV use occurs and noise and construction activities disrupting OHV users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission lines.

Variation S3-C4

Effects on recreation resources would be the same as those described for Variation S3-C3; however it crosses the Burnt River ERMA for 3.3 miles.

Variation S3-C5

Variation S3-C5 would result in no high impacts and 5.2 miles of moderate impacts from crossing hunting access areas and 0.7 mile of low impacts where Variation S3-C5 crosses the Snake River-Mormon Basin back country byway and recreational trails. Variation S3-C5 also crosses the Burnt River ERMA (3.9 miles) (Links and limited and open OHV designations. Effects on recreation resources would be the same as those described for Variation S3-C3.

Variation S3-C6

Variation S3-C6 would result in no high impacts and 2.5 miles of moderate impacts from crossing hunting access areas and 0.8 mile of low impacts where Variation S3-C6 crosses the Snake River-Mormon Basin back country byway and recreational trails. Variation S3-C6 also crosses the Burnt River ERMA (4.4 miles) (and limited and open OHV designations. Effects on recreation resources would be the same as those described for Variation S3-C3.

Flagstaff A Alternative

The Flagstaff A Alternative would result in no high impacts, 6.3 miles of moderate residual impacts where the alternative crosses hunting access areas and 1.8 miles of low impacts where the alternative crosses the Grand Tour Route scenic bikeway, Snake River-Mormon Basin back country byway, and Hells Canyon All-American highway and recreational trails (MV-19). To minimize potential effects on scenic byways and hunting access areas, existing access will be used (Selective Mitigation Measure 2), new access roads to the hunting access areas would be prohibited (Selective Mitigation Measure 6), towers structures would be placed to avoid directly affecting the hunting access area, Snake River-Mormon Basin back country byway and recreational trail access points (Selective Mitigation Measure 8), and maximize the span over hunting access areas, Snake River-Mormon Basin back country byway points, and recreational trails (Selective Mitigation Measure 10). In addition to the recreation resources listed above, Flagstaff A Alternative also crosses the Burnt River ERMA for (3.0 miles), limited and open OHV designations. Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting hunters, byway, and/or OHV users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

This variation is on the western side of the NHOTIC while Applicant's Proposed Action is on the eastern side of the NHOTIC. Neither alternative directly impacts trails or recreation sites at the NHOTIC, but the view shed of recreationists at the NHOTIC would be affected. This alternative takes the route furthest west of the NHOTIC.

Timber Canyon Alternative

The Timber Canyon Alternative would result in no high or moderate impacts and 1.8 miles of low impacts where the Timber Canyon Alternative crosses the Grand Tour Route scenic bikeway, Snake River-Mormon Basin back country byway, and Hells Canyon All-American highway and recreational trails (MV-19). To minimize potential effects on scenic byways, existing access will be used (Selective Mitigation Measure 2), new access roads would be prohibited (Selective Mitigation Measure 6), towers structures would be placed to avoid directly affecting the scenic byway (Selective Mitigation Measure 8), and maximize the span over scenic byway access points (Selective Mitigation Measure 10). In addition to the recreation resources listed above, Timber Canyon Alternative also crosses a roaded natural ROS and limited and open OHV designations. Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting byway, and/or OHV users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

This alternative route would have no identifiable impact on recreation at the NHOTIC because of its distance from the NHOTIC.

Flagstaff A – Burnt River Mountain Alternative

Flagstaff A – Burnt River Mountain Alternative has no high impacts, 7.6 miles of moderate residual impacts where the Burnt River Mountain Alternative crosses hunting access areas, and 0.3 mile of low impacts where the Flagstaff A – Burnt River Mountain Alternative crosses Grand Tour Route scenic bikeway, Snake River-Mormon Basin back country byway, and Hells Canyon All-American highway and recreational trails. This variation would have the same mitigation and results as Flagstaff A Alternative. In addition, Flagstaff A – Burnt River Mountain Alternative crosses limited and open OHV designations and would have the same mitigation and results as Flagstaff A Alternative.

This alternative would have the same impacts on recreation at the NHOTIC as the Flagstaff A Alternative because it shares the same alignment where it passes the NHOTIC.

Flagstaff B Alternative

The Flagstaff Alternative would result in no high impacts, 6.3 miles moderate impacts the Flagstaff B Alternative crosses hunting access areas and 1.9 miles of low impacts where the Flagstaff B Alternative crosses the Grand Tour Route scenic bikeway, Snake River-Mormon Basin back country byway, and Hells Canyon All-American highway and recreational trails (MV-19). To minimize potential effects, the use of existing access will occur (Selective Mitigation Measure 2), new access roads to the hunting access areas would be prohibited (Selective Mitigation Measure 6), towers structures would be placed to avoid directly affecting the hunting area access points (Selective Mitigation Measure 8), and maximize the span over hunting area access points (Selective Mitigation Measure 10). In addition to the recreation resources listed above, Flagstaff B Alternative also crosses open and limited OHV designations. Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting byway, trail and/or OHV users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

This alternative would have greater impacts on recreation at the NHOTIC than the Flagstaff A Alternative, and the same impacts as the Flagstaff B – Burnt River West alternative and Flagstaff B – Durkee Alternative, as it takes the route closest to the NHOTIC.

Flagstaff B – Burnt River West Alternative

Flagstaff B – Burnt River West Alternative would result in no high impacts and 8.9 miles of moderate impacts from crossing hunting access areas and 1.1 mile of low impacts where the alternative crosses the Grand Tour Route scenic bikeway, Snake River-Mormon Basin back country byway, and Hells Canyon All-American highway and recreational trails. Flagstaff B – Burnt River West Alternative also crosses the Burnt River ERMA (3.9 miles) (and limited and open OHV designations. Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting hunters, byway, trail and/or OHV users. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

This alternative would have the same impacts on recreation at the NHOTIC as the Flagstaff B and Flagstaff B – Durkee Alternatives because it shares the same alignment as those alternatives when it passes the NHOTIC.

Flagstaff B – Durkee Alternative

Flagstaff B – Durkee would result in no high impacts and 6.2 miles of moderate impacts from crossing hunting access areas and 1.2 mile of low impacts where the alternative crosses the Grand Tour Route scenic bikeway, Snake River-Mormon Basin back country byway, and Hells Canyon All-American highway and recreational trails. Flagstaff B – Durkee also crosses the Burnt River ERMA (4.4 miles) and limited and open OHV designations. Flagstaff B- Durkee Alternative would have the same mitigation and results as Flagstaff B – Burnt River West Alternative and Flagstaff B Alternative. Short-term effects from construction activities would include temporary disturbance, restriction or closure of access to the area and noise and construction activities disrupting hunters, byway, trail and/or OHV designations. Long-term effects generally would be expected to be minimal with occasional noise and dust that may occur during maintenance activities on the transmission line and visual effects.

This alternative would have the same impacts on recreation at the NHOTIC as the Flagstaff B – Burnt River West Alternative and Flagstaff B Alternative because it shares the same alignment as those alternatives when it passes the NHOTIC.

Conclusions

Moderate impacts on hunting areas are expected from the Applicant's Proposed Action Alternative (and Variations S3-C1 through S3-C6) and the Flagstaff A, Flagstaff B, Flagstaff B- Burnt River West, and Flagstaff B – Durkee alternatives. The Timber Canyon Alternative would not affect the ODFW hunting areas. No other high or moderate impacts on recreation are expected from the alternative routes and route variations analyzed in Segment 3.

SEGMENT 4—BROGAN

Table 3-374 presents the residual impacts on all alternative routes and route variations in Segment 4.

Table 3-374. Recreation Inventory Data and Residual Impacts in Segment 4—Brogan

Alternative Route	Total Length (miles)	Resource Inventory (miles)					Residual Impacts (miles)[1]		
		Hunting Areas[2]	Scenic Byways	Recreation Areas/State Parks	Recreation Management Areas	Trails	High	Moderate	Low
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*

Table 3-374. Recreation Inventory Data and Residual Impacts in Segment 4—Brogan									
Alternative Route	Total Length (miles)	Resource Inventory (miles)					Residual Impacts (miles)[1]		
		Hunting Areas[2]	Scenic Byways	Recreation Areas/State Parks	Recreation Management Areas	Trails	High	Moderate	Low
Tub Mountain South	40.5	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3
Willow Creek	34.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table Notes:
[1]Combined results of overall residual impacts may not sum due to overlapping impact locations.
[2]Hunting areas as identified using data provided by IDPR, ODFW, and Morrow County

Applicant's Proposed Action

The Applicant's Proposed Action has no high, moderate, or low impacts on recreation resources. Roaded natural, rural, semi-primitive motorized, and semi-primitive non-motorized ROS managed by the Malheur Field Office would be affected but impacts would be low. Long-term effects on the management of these ROS areas are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of these ROS areas, especially in the semi-primitive non-motorized ROS area. Motorized vehicles should avoid crossing semi-primitive non-motorized areas. If a vehicle must cross this area, existing trails or roads should be used.

Variations S4-A1 through S4-A3

Variations S4-A1 through S4-A3 have no high, moderate, or low impacts on recreation resources. Open and limited OHV designations would be affected but impacts would be low. Long-term effects on the open and limited OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the open and limited OHV designations.

Tub Mountain South Alternative

Tub Mountain South Alternative has no high or moderate impacts and 0.3 mile of low impacts where crossing the recreational trails.). To minimize potential effects on trails, existing access would be used (Selective Mitigation Measure 2), towers structures would be placed to avoid directly affecting the trail (Selective Mitigation Measure 8), and maximize the span over the trails (Selective Mitigation Measure 10).

Roaded natural, rural, semi-primitive motorized and semi-primitive non-motorized ROS areas managed by Malheur Field Office and limited and open OHV designations would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from

construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas, especially in the semi-primitive non-motorized ROS area. Motorized vehicles should avoid crossing semi-primitive non-motorized areas. If a vehicle must cross this area, existing trails or roads should be used.

Willow Creek Alternative

Willow Creek Alternative has no high, moderate, or low impacts on recreation resources. Rural and semi-primitive motorized ROS areas managed by Malheur Field Office and limited and open OHV designations would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas.

Conclusions

No high or moderate impacts on recreation resources are expected from the alternative routes or route variations analyzed in Segment 4. The Tub Mountain South Alternative is the only alternative that crosses recreation trails; however, impacts on recreation trails would be low.

SEGMENT 5—MALHEUR

Table 3-375 presents the residual impacts on all alternative routes and route variations in Segment 5.

Table 3-375. Recreation Inventory Data and Residual Impacts in Segment 5—Malheur

Alternative Route	Total Length (miles)	Resource Inventory (miles)					Residual Impacts (miles)[1, 2]		
		Hunting Areas[3]	Scenic Byways	Recreation Areas/State Parks	Recreation Management Areas	Trails	High	Moderate	Low
Applicant's Proposed Action	40.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Malheur S	43.5	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0
Malheur A	43.1	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0

Table Notes:
[1]Residual impacts do not include miles crossed for Recreation Management Areas.
[2]Combined results of overall residual impacts may not sum due to overlapping impact locations.
[3]Hunting areas as identified using data provided by IDPR, ODFW, and Morrow County

Applicant's Proposed Action

The Applicant's Proposed Action has no high, moderate, or low impacts on recreation resources. Roaded natural, rural, semi-primitive motorized and semi-primitive non-motorized ROS areas managed by Malheur Field Office and limited and open OHV designations would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas, especially in the semi-primitive non-motorized ROS area. Motorized vehicles should avoid crossing semi-primitive non-motorized areas. If a vehicle must cross this area, existing trails or roads should be used.

Variation S5-A1

Variation S5-A1 has no high, moderate, or low impacts on recreation resources. Rural and semi-primitive motorized ROS areas managed by Malheur Field Office and open OHV designation would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas.

Variation S5-A2

Variation S5-A2 has no high, moderate, or low impacts on recreation resources. Semi-primitive motorized and semi-primitive non-motorized ROS areas managed by the Malheur Field Office and open OHV designation would be affected but impacts would be low. Long-term effects on the management of these ROS areas and the OHV designation are not anticipated. However, short-term effects may include visual, noise, dust, and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas, especially in the semi-primitive non-motorized ROS area. Motorized vehicles should avoid crossing semi-primitive non-motorized areas. If a vehicle must cross this area, existing trails or roads should be used.

Variation S5-B1

Variation S5-B1 has no high, moderate, or low impacts on recreation resources. Roaded natural and semi-primitive motorized ROS areas managed by the Malheur Field Office and limited and open OHV designations would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas.

Variation S5-B2

Variation S5-B2 has no high, moderate, or low impacts on recreation resources. Roaded natural, rural, and semi-primitive motorized ROS areas managed by the Malheur Field Office and limited and open OHV designations would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas.

Malheur S Alternative

Malheur S Alternative has no high, moderate, or low impacts on recreation resources. Malheur S Alternative crosses the Owyhee River Below the Dam SRMA for 1.3 miles (Link 5-30). This SRMA coincides with the Owyhee River Below the Dam ACEC (refer to Section 3.2.6) and Owyhee River Below the Dam suitable Wild and Scenic River (refer to Section 3.2.11). The recreation values of this SRMA include high-quality scenery, driving and walking/hiking for pleasure, varied wildlife and historic resource viewing, photography, camping, hunting, fishing, and water play at the Snively Hot Springs Recreation site (Link 5-50) (BLM 2002). This area is considered an avoidance area for new right-of-ways. New right-of-ways will only be granted if there is minimal conflict with identified relevant and important resource values and adverse impacts could be mitigated (BLM 2002).

Roaded natural, rural, semi-primitive motorized and semi-primitive non-motorized ROS areas managed by Malheur Field Office and limited and open OHV designations would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas, especially in the semi-primitive non-motorized ROS area. Motorized vehicles should avoid crossing semi-primitive non-motorized areas. If a vehicle must cross this area, existing trails or roads should be used.

Malheur A Alternative

Malheur A Alternative has no high, moderate, or low impacts on recreation resources. Similar to Malheur S Alternative, Malheur A crosses the Owyhee River Below the Dam SRMA for 2.4 miles. Refer to Malheur S Alternative for more information regarding this crossing.

Roaded natural, rural, semi-primitive motorized and semi-primitive non-motorized ROS areas managed by Malheur Field Office and limited and open OHV designations would be affected but impacts would be low. Long-term effects on the management of these ROS areas and OHV designations are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the limited and open OHV designations and ROS areas, especially in the semi-primitive non-motorized ROS area. Motorized vehicles should avoid crossing

semi-primitive non-motorized areas. If a vehicle must cross this area, existing trails or roads should be used.

Conclusions

No high, moderate or low impacts on recreation resources would be expected from any of the alternative routes and route variations analyzed in Segment 5.

SEGMENT 6—TREASURE VALLEY

Table 3-376 presents the residual impacts on all alternative routes and route variations in Segment 6.

Table 3-376. Recreation Inventory Data and Residual Impacts in Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Resource Inventory (miles)					Residual Impacts (miles)[1, 2]		
		Hunting Areas[3]	Scenic Byways	Recreation Areas/State Parks	Recreation Management Areas	Trails	High	Moderate	Low
Applicant's Proposed Action	28.0	0.0	0.0	0.0	23.9	3.5	0.0	0.0	3.5
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*6.7*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*6.8*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*0.0*	*14.4*	*2.9*	*0.0*	*0.0*	*2.9*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*0.0*	*14.1*	*1.5*	*0.0*	*0.0*	*1.5*

Table Notes:
[1]Residual impacts do not include miles crossed for Recreation Management Areas.
[2]Combined results of overall residual impacts may not sum due to overlapping impact locations.
[3]Hunting areas as identified using data provided by IDPR, ODFW, and Morrow County

Applicant's Proposed Action

The Applicant's Proposed Action has no high or moderate impacts and 3.5 miles of low impacts where crossing the recreational trails. To minimize potential effects on trails, existing access will be used (Selective Mitigation Measure 2), towers structures would be placed to avoid directly affecting the trail (Selective Mitigation Measure 8), and maximize the span over the trails (Selective Mitigation Measure 10).

In addition to crossing recreational trails, the Applicant's Proposed Action crosses Jump Creek SRMA (1.3 miles) (Link 6-20), Owyhee Front SRMA (10.9 miles) (Link 6-20), Squaw Creek Addition SRMA (1.9 miles) (Link 6-30), and Owyhee ERMA (9.8 miles) (Link 6-30) are managed under the Owyhee Resource Management Plan. The Applicant's Proposed Action also crosses limited to designated, limited to existing, and limited OHV designations and the primitive, roaded natural, and semi-primitive motorized. These SRMAs, limited OHV designations, and ROS areas would be affected but impacts would be low. Long-term effects on the management of these SRMAs, OHV designations, and ROS areas are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other

resources to reduce impacts on the natural environment of the SRMAs and limited OHV designations, especially in the semi-primitive non-motorized ROS area of the Jump Creek SRMA. Motorized vehicles should avoid crossing primitive and semi-primitive non-motorized areas. If a vehicle must cross a semi-primitive non-motorized area, existing trails or roads should be used.

Variations S6-A1 and S6-A2

Variations S6-A1 and S6-A2 do not have high, moderate, or low impacts. Variations S6-A1 and S6-A2 cross Jump Creek SRMA (1.2 miles) and Owyhee ERMA (5.5 miles); primitive, roaded natural, and semi-primitive motorized ROS areas, and limited to designated, limited to existing, and limited OHV designations. These SRMAs, OHV designations, and ROS areas would be affected but impacts would be low. Long-term effects on the management of these SRMAs, OHV designations, and ROS areas are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the SRMAs and limited OHV designations, especially in the semi-primitive non-motorized ROS area of the Jump Creek SRMA (Link 6-20). Motorized vehicles should avoid crossing primitive and semi-primitive non-motorized ROS areas. If a vehicle must cross this area, existing trails or roads should be used.

Variation S6-B1

Similar to the Applicant's Proposed Action Alternative, Variation S6-B1 has no high or moderate impacts and 2.9 miles of low impacts where crossing recreational trails. To minimize potential effects on trails, existing access will be used (Selective Mitigation Measure 2), towers structures would be placed to avoid directly affecting the trail (Selective Mitigation Measure 8), and maximize the span over the trails (Selective Mitigation Measure 10).

In addition to crossing recreational trails, the Applicant's Proposed Action Alternative, crosses Jump Creek SRMA (0.1 mile) (Link 6-20), Owyhee Front SRMA (8.6 miles) (Link 6-20), Squaw Creek Addition SRMA (1.9 miles) (Link 6-30), and Owyhee ERMA (3.8 miles) (Link 6-35) are managed under the Owyhee Resource Management Plan. The Applicant's Proposed Action Alternative, also crosses limited to designated and limited to existing OHV designations and the primitive, roaded natural, and semi-primitive motorized. These SRMAs, limited and open OHV designations, and ROS areas would be affected but impacts would be low. Long-term effects on the management of these SRMAs, OHV designations, and ROS areas are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the SRMAs and limited and open OHV designations, especially in the semi-primitive non-motorized ROS area of the Jump Creek SRMA. Motorized vehicles should avoid crossing primitive areas. If a vehicle must cross this area, existing trails or roads should be used.

Variation S6-B2

Similar to the Variation S6-B1, Variation S6-B2 has no high or moderate impacts and 1.5 miles of low impacts where crossing recreational trails. To minimize potential effects on trails, existing access will be used (Selective Mitigation Measure 2), towers structures would be placed to avoid directly affecting the

trail (Selective Mitigation Measure 8), and maximize the span over the trails (Selective Mitigation Measure 10).

In addition to crossing recreational trails, the Applicant's Proposed Action Alternative, crosses Jump Creek SRMA (0.1 mile) (Link 6-20); Owyhee Front SRMA (8.6 miles) (Link 6-20), Squaw Creek Addition SRMA (1.9 miles) (Link 6-30), and Owyhee ERMA (3.8 miles) (Link 6-35) are managed under the Owyhee Resource Management Plan. The Applicant's Proposed Action Alternative, also crosses limited to designated and limited to existing OHV designations and the primitive, roaded natural, and semi-primitive motorized. These SRMAs, limited OHV designations, and ROS areas would be affected but impacts would be low. Long-term effects on the management of these SRMAs, OHV designations, and ROS areas are not anticipated. However, short-term effects may include visual, noise, dust and vehicle emissions from construction activities and equipment. Mitigation measures may be applied for other resources to reduce impacts on the natural environment of the SRMAs and limited OHV designations, especially in the semi-primitive non-motorized ROS area of the Jump Creek SRMA. Motorized vehicles should avoid crossing semi-primitive non-motorized areas. If a vehicle must cross this area, existing trails or roads should be used.

Conclusions

No high or moderate impacts on trails, hunting areas, recreation areas and state parks would be anticipated in Segment 6. Only minor effects on recreation management areas would be anticipated. The Applicant's Proposed Action Alternative crosses the greatest amount of recreation management areas; however, impacts would be minor.

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3.2.9 TRANSPORTATION

3.2.9.1 INTRODUCTION

This section describes transportation of the region within eastern Oregon and western Idaho that would be affected by the proposed B2H Project.

3.2.9.2 REGULATORY FRAMEWORK

FEDERAL

Federal Highway Administration

Section 101 of the National Highway System Designation Act of 1995 (revision of 23 CFR 470) designates the National Highway System in the U.S., including the District of Columbia and the Commonwealth of Puerto Rico, and authorized the Secretary of Transportation to make future modifications to the system. This includes interstate and U.S. highways. The American Association of State Highway and Transportation Officials and the Federal Highway Administration (FHWA) are responsible for interstate and U.S. highways in individual states.

Bureau of Land Management

Roads on BLM-administered land are typically managed through travel management planning BLM travel management plans identify designated areas and roads for type of motorized use, motorized travel restricted area, and seasons restricted. New and improved road construction on BLM-administered land used for B2H Project construction, operation, and maintenance must requirements identified by the BLM Travel Management Program and the BLM Manual Section 9113 (BLM 2011).

The use of existing roads for hauling oversize or over-weight loads, or hauling commercial or construction materials also requires prior written authorization from the BLM. It is anticipated that any use, improvement or construction of BLM roads would be addressed in the POD.

U.S. Forest Service

Travel management plans for USFS-administered land in the B2H Project area have been developed and typically identify designated areas and roads for type of motorized use, motorized travel restricted areas, and seasonal restrictions. For USFS-administered land, compliance with the Forest Service Manual and Forest Service Handbook would be required. Applicable handbooks include 7709.56 – *Road Preconstruction Handbook* (USFS 2011); 7709.57– *Road Construction Handbook* (USFS 1994); 7709.58 – *Transportation System Maintenance Handbook* (USFS 2009); and 7709.59 – *Road System Operations and Maintenance Handbook* (USFS 2009: Chapter 60), or most current edition. In addition, Forest Service Handbook 7709.56b (USFS 2014)- *Transportation Structures Handbook Chapter 70 – Road Bridge Design* – would be applied to design bridges and other road structures requiring structural engineering in conformance with the provisions of AASHTO's *LRFD Bridge Design Specifications, Current Edition*. In addition, signage and pavement markings would conform to the Manual on Uniform Traffic Control Devices (FHWA 2009), or most current edition. These requirements are not anticipated to apply to B2H Project two-track roads or to routes for all-terrain vehicles or utility-terrain vehicles.

The use of existing roads for hauling oversize or over-weight loads, or hauling commercial or construction materials also requires prior written authorization from USFS. All use, maintenance, or improvement of Wallowa-Whitman National Forest System Roads shall require an approved road-use permit. Road-use permit applications shall be submitted a minimum of 3 weeks prior to the anticipated need for such activities. It is anticipated that any use, improvement or construction of USFS roads would be addressed in the POD.

To comply with the 2005 Travel Management Rule, the Wallowa-Whitman National Forest recently updated the Wallowa-Whitman National Forest Travel Analysis Report. The final plan was released in December of 2015 (USFS 2015).

Federal Aviation and Administration

Congress approved and on August 23, 1958, the President signed the Federal Aviation Act, which transferred the Civil Aeronautics Authority's functions to a new independent Federal Aviation Administration responsible for civil aviation safety. Therefore, FAA is charged with administrating all navigable airspace associated with NWSTF Boardman. As such; Title 14, Aeronautics and Space of Chapter 1 of the FAA, Department of Transportation, requires a Notice of Proposed Construction or Alteration (Form 7460-1) for a tower or span that meets the following criteria:

- Exceeds 200 feet above ground level
- Within 20,000 feet (3.79 miles) of a public-use or military airport that exceeds a 100:1 sloping surface from any point on the runway of each airport with at least one runway more than 3,200 feet
- Within 10,000 feet (1.89 miles) of a public-use or military airport that exceeds a 50:1 sloping surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
- Within 5,000 feet of a public-use heliport that exceeds a 25:1 sloping surface
- When requested by FAA
- Any construction or alteration located on a public-use airport or helicopter regardless of height or location

In addition, special-use airspace is regulated under an MOU between the FAA and the DoD titled *Concerning Environmental Review of Special Use Airspace Actions*, dated October 4, 2005. This MOU promotes early coordination between the FAA and the DoD during the environmental review process associated with the establishment, designation, and modification of special-use airspace (October 2005). The Navy has provided information to the Applicant indicating that similar conditions as those identified in the existing use agreement in place for the BPA 69-kV line would apply to the B2H Project as they are both aboveground utilities along a similar easement corridor (M. Vaughn, Idaho Power Company, email communication with author, 2016).

STATE REGULATORY AUTHORITIES

Roadways

State departments of transportation are responsible for building and maintaining state highways and routes. As discussed above, these states adopt design standards, specifications and guidelines for state highways and routes as well as the federal interstates and highways. The transportation departments also provide encroachment and occupancy permits for utility construction and operation activities. The state regulations and design standards are discussed for each state below.

Oregon Department of Transportation

The most current ODOT Oregon Standard Specification for Construction would provide guidance on design standards and specifications for construction, including Section 00200 – Temporary Features and Appurtenances; Section 00300 – Roadwork; Part 01000 – Right-of-Way Development and Control; and other sections as applicable.

Oregon Administrative Rule 734-055 requires an encroachment permit from ODOT Highway Division to construct pole lines, which include poles, wires, guys, anchors, and related fixtures within or across state road rights-of-way (ODOT 2016). The rule applies to and governs the location, installation, construction, maintenance, and use of pole lines and other operations on the state highway right-of-way and properties under ODOT jurisdiction. The ODOT district manager reviews permit applications for the following:

- Accommodation of utility facilities with no adverse effect on traffic safety, operation, maintenance, and aesthetic quality of the highway system
- Incorporation of the appropriate industry code standards and American Association of State Highway and Transportation Officials publications
- Placement of utility installations in reasonable locations for construction and maintenance
- Safe and unimpaired use of the highway
- Evaluation of environmental and economic impacts of any loss or impairment of productive agricultural land associated with alternatives of the utility facilities that are outside the highway right-of-way

Oregon Department of Aviation

The Oregon Department of Aviation has jurisdiction over many aspects of safe operation and aviation in Oregon. Notably, OAR 738-070-60 provides guidelines for determining whether specific objects or structures constitute a hazard to air navigation. Guidelines and regulations set forward by Oregon Department of Aviation apply to state and local facilities.

Oregon Forest Lands

In Oregon, activities on non-federal forest land must also comply with the Oregon Forest Practices Act rules; Oregon Revised Statute 527, and its attendant rules; and Oregon Administrative Rule Chapter 629, Divisions 605–665. These rules will apply to portions of the B2H Project that cross forest land. The

Oregon Forest Practices Act rules are intended to provide resource protection and set standards for planning forestry practices; conducting harvesting, road construction, and maintenance; protecting state water quality; limiting effects on specified resource sites (e.g., streams, wetlands, nesting bird sites); providing for public safety downslope of high landslide hazard locations; and determining reforestation or land conversion requirements. Under the Oregon Forest Practices Act, strict regulations govern the location, construction, maintenance, and repair of roads on non-federal forest land. Roads must avoid marshes; meadows; drainage channels; riparian management areas; and, when possible, steep terrain.

Idaho Department of Lands

Idaho APA 20.02.01 *Rules Pertaining to the Idaho Forest Practices Act* provides guidelines and road standards to maintain forest productivity, water quality, and fish and wildlife habitat.

Idaho Transportation Department

The most current Idaho Transportation Department's (ITD) Standard Specifications for Highway Construction, and Traffic Manual, and Utility Management manuals would provide guidance on construction, operation, and maintenance activity on IDT managed roadways.

In addition, construction, operation or maintenance activities on local highway facilities would be coordinated with the Local Highway Technical Assistance Council (LHTAC) and comply with the most recent design and construction, right-of-way and maintained manuals.

The ITD's Division of Aeronautics serves provides aviation services for the Idaho. The Division of Aeronautics provides guidance on land-use compatibility as well oversight for the safety and security of the airport system for Idaho.

LOCAL REGULATORY AUTHORITIES

County and local (other) roads have standards set by each county or city to guide the building and maintenance of these roads. Similar to the Department of Transportation of each state, counties and cities have encroachment permitting requirements for utility construction and operation activities. Before conducting work within or above a road right-of-way, an encroachment permit or similar authorization would be required from the applicable jurisdictional agency at locations where construction activities will occur within or above the public road right-of-way. The specific requirements of the encroachment permit from the applicable transportation agencies are determined on a project-by-project basis. The encroachment permit issued by state and local jurisdictions may include the following requirements:

- Identify all roadway locations where special construction techniques (e.g., night construction) will be used to minimize impacts on traffic flow.
- Develop circulation and detour plans to minimize impacts on local street circulation. This may include the use of signing and flagging to guide vehicles through or around the construction zone.
- Schedule truck trips outside of peak morning and evening commute hours.
- Limit, to the extent possible, lane closures during peak hours.

- Include detours for areas potentially affected by project construction.
- Install temporary traffic-control devices as specified in the Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA 2016).
- Store construction materials only in designated areas.

3.2.9.3 ISSUES IDENTIFIED FOR ANALYSIS

- Could B2H Project construction cause an increase in local road traffic or cause lane closures?
- Would the B2H Project cause wear and tear on existing roads?
- Would the B2H Project create new roads?
- Would construction and operation activities affect highways, bridges, and railroads?
- Would the B2H Project disrupt access for emergency-service providers, school buses, and mail delivery?
- Would the B2H Project affect airports and landing strip operations?
- Would the power lines and towers reduce aircraft routes for recreation, commercial use, military, or crop management?

3.2.9.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project on transportation.

As described in Section 2.3.1.4, typical access roads are classified in to three major types – (1) new roads (including new primitive roads or new bladed roads); (2) existing roads that will require substantial modification; and (3) existing roads that would not require substantial modification. Refer to Table 2-1 for information regarding the Typical Design Characteristics of access roads. Design standards, specifications, and guidelines that would be used for design and traffic control on roadways identified for use by the B2H Project would adhere to FHWA protocols in accordance with Oregon and Idaho adopted design standards and specifications for federal and state highways/routes. In addition, new and improved roads used for construction, operation, and maintenance must meet or exceed the minimum standards of width, alignment, grade, surface, and other requirements identified by the BLM Travel Management Program and the BLM Manual Section 9113 (BLM 2011) and the Forest Service Manual and Forest Service Handbook.

DATA SOURCES

Federal, state, and local transportation and access facilities and systems are located throughout the B2H Project, including roadways, airports and aviation facilities, and railroad facilities. The transportation and access resources (roadways, aviation facilities, and railroads) crossed by the transmission line alternative routes were identified using primary and secondary data sources, aerial photography interpretation, and data gathered from stakeholder input. Specific processes for each data collection effort are discussed below.

Roadways

An inventory of roadways crossed by the reference centerlines was conducted utilizing GIS road data and includes interstates, highways, and a variety of other roads. The roadways identified include those operated and maintained on federal, state, local (county and city), and private levels. Major roads include interstates, federal highways (Interstate), and state highways. The other roads category includes all roads types (improved county roads, city or country roads, two –track native soil roads) contained in the GIS data. Discussions of the major roads, likely to be affected during construction, are discussed by alternative route in Section 3.2.9.5.

Railroads

An inventory of railroads crossed by the reference centerlines for the alternative routes was identified utilizing the GIS railroad data. Union Pacific Railroad Company is the only entity operating within the study area.

Aviation Facilities

An inventory of aviation facilities (i.e., airports, airstrips and heliports) was collected for the 1-mile wide study area. GIS data for FAA registered facilities was used to identify registered airports, including private and public facilities. Aerial imagery also was used to supplement the FAA data to identify state and local airports within the one-mile-wide study corridor. In addition, input from public comment resulted in identification of one private landing strip located in the study area. This landing strip was digitized by hand to be included in the EIS study corridor.

ANALYSIS AREA

Specific access routes for each alternative route are not known at this time because the location of transmission line facilities (tower locations, etc.) has not yet been identified. Once a route is selected, detailed engineering would occur to site tower locations and design access roads. If this were done for all alternative routes being studied, the costs to develop detailed engineering would not be practical. Therefore, the study corridor for transportation is the same as the B2H Project area to account for transportation facilities that may be crossed by the B2H Project. Refer to MV-13 for locations of transportation facilities in the B2H Project area.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria were developed to assess the level of potential effects on transportation facilities associated with implementation of the B2H Project (Table 3-377).

Table 3-377. Criteria for Assessing Level of Impacts on Transportation	
Level of Impacts	**Description**
High	• Areas where the B2H Project would conflict physically and create a direct long-term conflict with existing transportation infrastructure. • Areas where the B2H Project would conflict with the management of a transportation facility that would not allow for a facility to continue operating.
Moderate	• Areas where the B2H Project would create short-term impacts on transportation infrastructure during construction, operation, and maintenance activities • Areas where the B2H Project would reduce the level of service of a federal, state or county highway.
Low	• Areas where the B2H Project would not conflict with the operation or maintenance of existing transportation infrastructure. • Areas where congestion or disruption of the use of transportation infrastructure would be short term and reversible.

Effects Analysis

Assessment of Initial Impacts

To determine initial impacts that could result from implementation of the B2H Project, the level of a potential effect on transportation was assessed. The level of impact was determined based on the compatibility of the transportation system with construction of a new transmission line. The initial impacts were assigned using the criteria presented in Table 3-378.

Table 3-378. Summary of Initial and Residual Impacts on Transportation			
Resource	**Initial Impacts**	**Selective Mitigation Measures Applied**	**Residual Impacts**
Federal, State, or County Highway	Moderate	1, 2, 5, 8	Low
Transportation Infrastructure (new and improvements on existing)	Moderate	1,2,5,6	Low
Airport or heliport	High	7, 8	Low
Landing Strip or Runway	High	7, 8	Moderate
Railroad	High	2	Low

Because the FAA is charged with administrating all navigable airspace associated with NWSTF Boardman; Title 14, Aeronautics and Space of Chapter 1 of the FAA, Department of Transportation will apply. A Notice of Proposed Construction or Alteration (Form 7460-1) will be required for a tower or span that meets the following criteria:

- Exceeds 200 feet above ground level
- Within 20,000 feet (3.79 miles) of a public-use or military airport that exceeds a 100:1 sloping surface from any point on the runway of each airport with at least one runway more than 3,200 feet
- Within 10,000 feet (1.89 miles) of a public-use or military airport that exceeds a 50:1 sloping surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
- Within 5,000 feet of a public-use heliport that exceeds a 25:1 sloping surface

- When requested by the FAA
- Any construction or alteration located on a public-use airport or helicopter regardless of height or location

The guidelines and regulations set forward by Oregon Department of Aviation also apply to state and local facilities.

In addition, Oregon Administrative Rule 734-055 requires an encroachment permit from ODOT Highway Division to construct pole lines, which include poles, wires, guys, anchors, and related fixtures within or across state road rights-of-way (ODOT 2016).

In Idaho, ITD Standard Specifications for Highway Construction, and Traffic Manual, and Utility Management manuals would provide guidance on construction, operation, and maintenance activity on IDT managed roadways. B2H Project construction, operation or maintenance activities on local highway facilities would be coordinated with the LHTAC and comply with the most recent design and construction, right-of-way and maintained manuals.

Mitigation Planning and Effectiveness

As described in Section 2.3, the Applicant intends to use existing roads for the B2H Project where possible. In areas where the existing roads do not meet the requirement s of the Applicant, existing roads would be enhanced and/or new roads would be constructed to facilitate project activities. In all cases, road improvements and new roads constructed for the B2H Project also would be constructed to meet agency and local government standards and/or requirements.

As identified in Table 2-7, the Applicant would develop a detailed Traffic and Transportation Management Plan (as part of the POD). This plan will identify specific measures that would be implemented to comply with federal, state, and local policies and standards relative to planning, siting, improvement, operation, and maintenance of roads for the B2H Project. These measures also would apply to state and private land.

The Applicant would incorporate design features (refer to Table 2-7) as part of the B2H Project description to limit impacts on transportation infrastructures.

The level of B2H Project effects on transportation resources that could result from implementation of the B2H Project was used as the basis for assessing initial impacts. Design features of the B2H Project for environmental protection (Table 2-7) that would reduce impacts on transportation resources were considered when assessing potential impacts on specific resources. Based on the level of potential effect, initial impacts were assigned (Table 3-378) using the criteria presented in Table 3-377)

In addition to design features (Table 2-7); selective mitigation measures were developed to minimize adverse impacts on transportation infrastructure and systems. The selective mitigation measures that would be applied are identified below:

- ***Selective Mitigation Measure 1 (Limit Widening of Existing Roads).*** Applied to reduce the amount of road upgrades and construction in areas that are identified as sensitive (example

resources: visual, wildlife , water, soils). Existing roads would be used to the extent possible/practicable.

- ***Selective Mitigation Measure 2 (Use Existing Access and/or Stream Crossings).*** Applied to minimize construction of access roads in areas identified as sensitive (example resources: visual, wildlife, water, soils). Existing access and stream crossings would be used to the extent possible/practicable.
- ***Selective Mitigation Measure 5 (Minimize Vegetation Clearing).*** Applied to new and improved roadways to minimize B2H Project effect on the existing environment. Selectively removing vegetation (edge feathering) instead of clearing a straight line would minimize effects from construction of new roads.
- ***Selective Mitigation Measure 6 (Limit New or Improved Accessibility).*** Applied to minimize new opportunities for public access via new or improved access routes.
- ***Selective Mitigation Measure 7 (Tower Design Modification).*** Applied to meet FAA and NWSTF Boardman air space requirements where necessary.
- ***Selective Mitigation Measure 8 (Span and/or Avoid Sensitive Features)***. Applied to avoid railroad right-of-way, landing strips, roadway right-of-way, and transportation interchange/intersections. This would be applied as needed in compliance with requirements set forward by FAA, Federal Railroad Administration, ODOT and ITD.

Residual Impacts

The above listed selective mitigation measures are applied to reduce the level of impacts associated with B2H Project construction, operation, and maintenance. Residual impacts are anticipated impacts on transportation resources after the application of the selective mitigation measures. The level of potential residual impacts on transportation resources associated with implementation of the B2H Project was assessed using the criteria presented in.

3.2.9.5 Affected Environment

This section identifies the transportation facilities within the study area that could be affected by construction, operation, and maintenance of the B2H Project. Transportation facilities evaluated within the study area include railroads airports, landing strips and also roadways broken out as follows:

- Federal Highway (Interstate): Designed with long-distance travel in mind connecting 48 continuous states.
- State Highway: Serve regional and intrastate traffic.
- County Road: Serves local traffic and can vary from multi-lane roads to dirt roads.
- Other Road: Include city or private, two-track native soil roads and any other roads identified in GIS dataset not already categorized above.

SEGMENT 1—MORROW-UMATILLA

Table 3-379 below presents the transportation resource inventory for Segment 1.

Table 3-379. Transportation Inventory Data for Segment 1—Morrow-Umatilla	
Transportation Facility Type	**Number of Facilities Present within 1 mile corridor**
Federal Highway	4
State Highway	8
County Road	1
Other Road	66
Airport	None
Airstrips	None
Rail Road Mainline	1
Rail Spur	7
Rail Siding	7
Railyard	1

Highways, Roads, Bridges, Railroads

The largest roadway in the study area is I-84 (collocated with U.S. Highway 30) providing an east-west travel route through the study area and onward. North-south travel within Segment 1 is facilitated by Bombing Range Road, State Highway 207, and U.S. Highway 395.

Union Pacific Railroad is the only rail operator within Segment 1. The railroad enters the B2H study area at the northwest corner (near Umatilla, Oregon) where the Segment 1 alignments begin. It continues north of I-84 until it drops down crossing the Umatilla River continuing east to Pendleton or farther south to Pilot Rock. Table 3-379 shows the miles of existing transportation facilities crossed by the proposed alternative routes in Segment 1.

Airports, Airstrips and Heliport

There are no airports, airstrips, or heliports located within the one-mile-wide study area for Segment 1.

SEGMENT 2—BLUE MOUNTAINS

Table 3-380 below presents the transportation resource inventory for Segment 2.

Table 3-380. Transportation Inventory Data for Segment 2—Morrow-Umatilla	
Transportation Facility Type	**Number of Facilities Present within 1 mile corridor**
Interstate Highway	1
U.S. Highway	None
State Highway	2
County Road	None
Other Road	17
Airport	None
Airstrips	None
Rail Road Mainline	1

Table 3-380. Transportation Inventory Data for Segment 2—Morrow-Umatilla	
Transportation Facility Type	**Number of Facilities Present within 1 mile corridor**
Rail Spur	None
Rail Siding	None
Railyard	None

Highways, Roads, Bridges, Railroads

The largest roadway in the study area is I-84 (collocated with U.S. Highway 30) providing an east-southwest travel route through the study area and onward. State Highway 244 spurs off of I-84 traveling west while State Highway 237 provides a north-south travel route.

Union Pacific Railroad is the only rail operator within the study corridor. Within Segment 2, the railroad runs parallel (and north) of I-84 until it drops down through North Powder continuing south. Table 3-386 shows the miles of existing transportation facilities crossed by the proposed alternative routes in Segment 2.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located in Segment 2 of the Study corridor.

SEGMENT 3—BAKER VALLEY

Table 3-381 below presents the transportation resource inventory for Segment 3.

Table 3-381. Transportation Inventory Data for Segment 3—Morrow-Umatilla	
Transportation Facility Type	**Number of Facilities Present within 1 mile corridor**
Interstate Highway	None
U.S. Highway	None
State Highway	None
County Road	None
Other Road	156
Airport	None
Airstrips	None
Rail Road Mainline	1
Rail Spur	None
Rail Siding	4
Railyard	None

Highways, Roads, Bridges, Railroads

The largest roadway in the study area is I-84 (collocated with U.S. Highway 30) providing an east-southwest travel route through the study area and onward. In addition Old Oregon Trail Highway, and Union Pacific Railroad parallel Interstate 84 (east-west) until they reach the boundary of Segment 3 in Dixie, Oregon in Baker County.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located in Segment 3 of the Study corridor.

SEGMENT 4—BROGAN

Table 3-382 below presents the transportation resource inventory for Segment 4.

Table 3-382. Transportation Inventory Data for Segment 4—Morrow-Umatilla

Transportation Facility Type	Number of Facilities Present within 1 mile corridor
Interstate Highway	1
U.S. Highway	2
State Highway	None
County Road	None
Other Road	45
Airport	None
Airstrips	1
Rail Road Mainline	1
Rail Spur	None
Rail Siding	None
Railyard	None

Highways, Roads, Bridges, Railroads

The largest transportation facilities in Segment 4 are Interstate 84, U.S. Highway 30, and U.S. Highway 26 which provide north to southeast travel. Union Pacific Railroad is located on the north side Interstate 84 and then exits the B2H Project area heading towards Weiser.

Airports, Airstrips, and Heliport

The Gum Creek airstrip is a dirt airstrip located within Segment 4 about 1.5 miles west of Jamieson, Oregon. The airstrip is privately operated and has been used to support agricultural practices since the 1980s.

SEGMENT 5—MALHEUR

Table 3-383 below presents the transportation resource inventory for Segment 5.

Table 3-383. Transportation Inventory Data for Segment 5—Malheur

Transportation Facility Type	Number of Facilities Present within 1 mile corridor
Interstate Highway	None
U.S. Highway	1
State Highway	None
County Road	None
Other Road	19
Airport	None
Airstrips	None
Rail Road Mainline	None

Table 3-383. Transportation Inventory Data for Segment 5—Malheur	
Transportation Facility Type	**Number of Facilities Present within 1 mile corridor**
Rail Spur	None
Rail Siding	None
Railyard	None

Highways, Roads, Bridges, Railroads

The largest transportation facility in Segment 5 is U.S. Highway 20 is the largest transportation facility which provides east-west transportation between Vale, Juntura and onward.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located in Segment 5 of the Study corridor.

SEGMENT 6—TREASURE VALLEY

Table 3-384 below presents the transportation resource inventory for Segment 6.

Table 3-384. Transportation Inventory Data for Segment 6—Morrow-Umatilla	
Transportation Facility Type	**Number of Facilities Present within 1 mile corridor**
Interstate Highway	None
U.S. Highway	1
State Highway	1
County Road	None
Other Road	13
Airport	None
Airstrips	None
Rail Road Mainline	None
Rail Spur	None
Rail Siding	None
Railyard	None

Highways, Roads, Bridges, Railroads

The largest transportation facility in Segment 6 is U.S. Highway 95 which provides north-south transportation between Marsing, Jordan Valley and onward.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located in Segment 6 of the Study corridor.

3.2.9.6 ENVIRONMENTAL CONSEQUENCES (RESULTS OF ANALYSIS)

TYPES OF POTENTIAL EFFECTS

The improvement of existing access and construction of new roads for the B2H Project would result in effects on transportation resources. Short and long-term effects associated with construction, operation, and maintenance of the B2H Project could include:

- Increased traffic on roadways from construction personnel and construction equipment (short term).
  - During construction, roadways would experience an increase in the volume of traffic as a result of construction personnel commuting from towns in the vicinity of the B2H Project to the job site(s), typically in the morning and evenings.
  - Throughout the workday, deliveries of materials and transport of construction equipment and/or personnel to various work areas could occur.
  - Increases in traffic volume (both from commuting to/from the worksite and/or from construction related activities) could result in congestion of traffic on the existing road network and potentially interfere with school and mail routes. Increased traffic volume could result in increased accidents on the existing roadway network and require additional emergency response.
- Traffic delays and/or temporary closures of roadways and/or railroads during construction (short term).
  - Construction of the B2H Project would require conductors to span roadways and railroads. Construction of the B2H Project would not alter the alignment of roadways and railroads crossed by the B2H Project, but delays and/or temporary closures could occur because of safety concerns during stringing operations of conductors.
- Potential interference with railroad communication signal frequencies for switching facilities (short term).

No effects on existing airports are anticipated. Short-term effects on private landing strips could occur during construction of the B2H Project from the presence of large equipment. Long-term effects from B2H Project infrastructure could result in slight changes in air travel patterns from B2H Project infrastructure.

NO ACTION ALTERNATIVE

Under the No Action Alternative, a right-of-way grant for the B2H Project would not be granted. The B2H Project would not be developed and the environment would remain as it presently exists.

EFFECTS COMMON TO ALL ALTERNATIVES

Highways, Roads, Bridges, Railroads

With implementation of design features of the B2H Project for environmental protection and selective mitigation measures for the B2H Project, effects on highways, roads, bridges and railroads are expected to be low for any route selected.

Potential impacts on transportation from geotechnical activities would be largely avoided through implementation of design features of the B2H Project for environmental protection (refer to Table 2-7). Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on transportation would be minor to negligible. Geotechnical testing would be coordinated the between

Applicant, ODOT, and Union Pacific to ensure compliance with safety requirements, and acquisition of encroachment permits, as needed.

Haul routes for water and construction materials are not yet identified. Once a route is selected, detailed engineering would occur to site tower locations, design access roads, and identify the roads needed for hauling. If this were done for all alternative routes being studies, the costs to develop detailed engineering would not be practical. Modification of existing roadways, new access to existing roadways, or construction of new access roadways would be closely coordinated with ODOT, ITD, county public works and transportation engineering staff to ensure appropriate compliance with local policies, standards, and permit requirements. In addition, the appropriate county permitting authority would oversee the hauling of large project equipment and material on county roads and bridges. The Applicant would submit a Traffic and Transportation Management Plan (as part of the POD) for approval by the appropriate federal and state agencies, local law enforcement, road departments, and local highway districts with authority to regulate use of public roads. This plan would be approved prior to the issuance of a Notice to Proceed with construction. This plan would specifically address existing conditions of roads identified for use in the POD (to be developed as part of the EIS process and approved prior to the BLM ROD); wear and tear on roads, bridges, and stream crossings; traffic control; access control; post-construction repair; and reclamation.

Ground transportation is anticipated to be the primary means of transportation construction and maintenance crews and equipment during construction. Helicopters would only be used as deemed necessary and will be incorporated in to the Traffic and Transportation Management Plan and POD if necessary.

The construction period is anticipated to be approximately 3 years from receipt of a Notice to Proceed. The B2H Project would be built in two spreads that would be constructed concurrently. During this time period, the increase in daily trips would occur primarily in the mornings and evenings due to construction workers commuting to and from the worksite. Therefore it is expected that the B2H Project would increase traffic (i.e., the number of daily trips) on the regional roadway network.

The direct effects of construction activities within rights-of-way of highways, local and other roads could include temporary road closures during truck delivery of large equipment and materials. Indirect effects could include road and bridge damage caused by vehicles and equipment (e.g., overhead-line cranes, concrete trucks, construction equipment, and material delivery trucks) when entering and leaving roads. Road-use permits (such as encroachment permits) or similar documents would require that construction contractors and the Applicant be responsible for rehabilitating or reconstructing roadways and structures during and after use. Construction traffic is not anticipated to disrupt access to residences. Where appropriate, the Applicant would provide the construction schedule to adjacent landowners.

Increased traffic and/or congestion and effects from slow moving, oversized loads of materials and/or construction equipment being delivered to multi-purpose construction yards would be most notable on county and other local roads that otherwise have low traffic and few options for detours. From the multi-purpose construction yards, materials and equipment would be dispersed where needed on the access

roads identified and approved in the POD. It also is anticipated that safety procedures would be outlined in the POD (i.e., temporary signage alerting drivers, flaggers, pilot trucks/escorts), would be followed to limit the potential of accidents. It is anticipated that deliveries and/or the transportation of construction equipment would be staggered during the work week to times when congestion from commuters is less likely to occur.

Although existing roads would be used to the extent possible, new access roads would be necessary for the B2H Project. New access developed for the B2H Project would typically be done under the assumption that new access would only be used by the Applicant's personnel for purposes associated with the B2H Project. It is anticipated these new access roads would be maintained by the Applicant and also would be incorporated in to the Traffic and Transportation Management Plan. The new access routes have the potential to increase access into areas previously inaccessible through unauthorized OHV use. The unauthorized access would have the potential for additional administrative considerations for agencies (i.e., additional enforcement, signage, disturbance and sensitive features, etc.). Through the application of selective mitigation measures to limit unauthorized access, close and rehabilitated unneeded roads; it is anticipated minimal impacts on the transportation system would occur.

Roadway maintenance during the construction period would be required in accordance with the Applicant's or/or agency standards and specifications for roadways. The Traffic and Transportation Management Plan will outline requirements for maintenance of federal, state, and local (other) roads to meet safety requirements.

Overhead construction activities could temporarily interfere with emergency services (fire, ambulance, and police) access and response, especially at locations that may be temporarily blocked by the construction zone. Roadway segments most likely to be affected are two-lane roadways that provide one lane of travel in each direction. The Applicant would coordinate in advance with emergency services, as well as with essential services such as post offices and school buses, as needed.

Substation construction associated with the B2H Project could cause temporary road and lane closures that could disrupt traffic flow or access and response by emergency-service providers. Construction activities also could disrupt pedestrian movement and safety on local (other) roads; temporary restrictions on access to properties, and damage local (other) roads and bridges in the area. If construction requires an encroachment permit, the permit requirements would be specified by the jurisdictional agency; the permitting agency and the Applicant would be responsible for enforcing the terms of the permit.

The Applicant has prepared a Traffic and Transportation Management Plan (Appendix A2 of the POD). The Traffic and Transportation Management Plan and the requirements of state and county encroachment permits would provide measures to ensure that traffic disruptions and delays are minimized, and that damage to roads and bridges is repaired. The Traffic and Transportation Management Plan would be approved by the appropriate federal, state, and local agencies before any Notice to Proceed is issued for construction. The Traffic and Transportation Management Plan would

ensure that B2H Project trips are planned in accordance with existing road conditions, specifications and safety standards. The Applicant would obtain permits that describe circulation and detour routes, lane closures, and other relevant factors. With implementation of the approved Traffic and Transportation Management Plan, traffic interruptions and road damage impacts would be low and short term during construction of the proposed B2H Project.

After construction is completed, any new roads developed for the B2H Project connecting to multi-use areas and other temporary-use areas would be removed and reclaimed to preconstruction conditions, unless the landowner requests otherwise. Roads developed for pulling-and-tensioning sites would be permanent if they would be needed for ongoing operation and maintenance.

During construction, railroad communications systems used to operate switching facilities could experience interference with signal frequencies. Coordination of scheduling with the railway operator during construction (specifically stringing of conductors) could avoid curtailment of railway operations. In addition, induction in the rails, especially during a short-circuit event, can cause risk to persons along the rail and to signal systems. Mitigation of potential interruptions and safety concerns would be addressed through coordination with Union Pacific prior to construction.

Airports, Airstrips, and Heliport

Ground transportation is anticipated to be predominant method of transportation for the construction, operation, and maintenance of B2H Project. Where deemed necessary, delivery of equipment and materials to structure sites; structure placement; hardware installation; and wire-stringing operations may be facilitated by helicopters. Various factors such as access to structure locations, the construction schedule, and construction economics would determine whether helicopters are used for structure erection. If helicopters are used, helicopter construction activities would be based at a fly yard (a project material staging area). The fly yards would be sited to permit a maximum fly time of 4 to 8 minutes to reach structure locations. If used, helicopter flights associated with B2H Project operations could affect airports, public and private, and heliports near the B2H Project area. These flights would be limited to the controlled zones identified by the FAA throughout the study corridor.

Civilian air-traffic patterns would not be affected by the placement of new structures or conductors because the B2H Project would not violate vertical obstruction prohibitions. In addition, coordination with airstrip operators would be necessary to avoid interference with airstrip operation.

SEGMENT 1—MORROW-UMATILLA

Table 3-385 presents the residual impacts on all alternative routes and route variations in Segment 1.

Table 3-385. Transportation Inventory Data and Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)		
		Federal Highway	State Highway	County Road	Rail	Landing Strip	High	Moderate	Low
Applicant's Proposed Action	91.9	0.4	0.7	0.0	1.1	0.0	0.0	0.0	2.2
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.2*
Variation S1-B2	*6.4*	*0.5*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.7*
East of Bombing Range Road	92.3	0.4	0.7	0.0	1.1	0.0	0.0	0.0	2.2
Applicant's Proposed Action – Southern Route	99.1	0.4	0.7	0.0	0.8	0.0	0.0	0.0	1.8
West of Bombing Range Road – Southern Route	95.6	0.4	0.4	0.0	0.9	0.0	0.0	0.0	1.7
Longhorn	88.2	0.4	0.7	0.0	1.7	0.0	0.0	0.0	2.8
Interstate 84	84.7	26.7	1	0.1	4	0.0	0.0	0.0	29.3
Variation S1-A1	*18.5*	*14.0*	*0.8*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*14.3*
Variation S1-A2	*18.5*	*0.1*	*0.2*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.5*
Interstate 84 – Southern Route	93.4	26.6	1.0	0.1	3.7	0.0	0.0	0.0	28.9

Table Note: There are no airports within the 1 mile study corridor this table only reports on landing strips. Local and other roads are not analyzed through the resource inventory process because the initial and residual impacts are anticipated to be low.

Applicant's Proposed Action Alternative

Highways, Roads, Bridges, Railroads

The Applicant's Proposed Action Alternative would result in a low level of impacts on highways, roads, bridges and railroad facilities. The types of effects on the transportation system would be similar to those described in Effects Common to All Alternatives section with the addition of impacts on Bombing Range Road and the existing railroad as discussed below.

Bombing Range Road is located along the eastern boundary of NWSTF Boardman and is open to public use. The portion of Bombing Range Road that is adjacent to NWSTF Boardman is owned by the Navy. The transmission line would parallel Bombing Range Road for about 12 miles outside the western boundary of the roadway right-of-way. It is the intention of the Applicant to repurpose the 90-foot-wide use area currently occupied by a 69-kV transmission line owned by BPA on the NWSTF Boardman. No long-term impacts on transportation on Bombing Range Road are anticipated from the replacement of the existing transmission line with the B2H Project. Transmission line construction, operation, and maintenance activities would occur outside of the roadway right-of-way and would be limited to areas approved by the Navy.

The Applicant's Proposed Action Alternative crosses the Union Pacific Railroad three times. It first crosses the rail where it exits the proposed Longhorn Substation, again north of Pilot Rock and lastly between Kamela and Hilgard (crossing Old Emigrant Hill Scenic Frontage Road). Selective Mitigation Measure 2 would be implemented to colocate the transmission line with existing crossings (roads or other utility lines) to avoid or minimize effects on railroad operations. Therefore, no long-term impacts are anticipated to operations and maintenance of railroad facilities.

Coordination of scheduling with the railway operator during construction (specifically stringing of conductors) could avoid curtailment of railway operations. In addition, induction in the rails, especially during a short-circuit event, can cause risk to persons along the rail and to signal systems. Mitigation of potential interruptions and safety concerns would be addressed through coordination with Union Pacific prior to construction.

Effects from Variation S1-B1 and Variation S1-B2 would be similar to those described in Effects Common to All Alternatives section. However, the S1-B1 Variation differs from the other alternative routes in Segment 1 in that it does not parallel the existing 230-kV line to avoid an additional crossing of I-84. The reduction of the additional crossing of I-84 could be beneficial to ODOT operations and maintenance activities.

The S1-B2 Variation differs from the other alternative routes in Segment 1 in that it is collocated with the existing 230-kV transmission line. Variation S1-B2 would provide benefits to roadway and railroad operations because it would reduce the number of new crossings of I-84 and the Union Pacific Railroad and, therefore, minimize safety risks and operational challenges associated with new crossings of these linear transportation facilities.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would not affect the safety, use, operation or maintenance of existing transportation facilities. Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative; however, these design options would affect a much smaller area.

Airports, Airstrips, and Heliport

There are no public or municipal airports, airstrips or heliports located within Segment 1 of the study area. However, the Applicant's Proposed Action Alternative and variations do utilize the 90 foot area currently occupied by the 69-kV transmission line owned by BPA. The NWSTF Boardman conducts regular air training activities in the study area. The FAA is charged with administrating all navigable airspace associated with NWSTF Boardman; refer to Map 3-2 in Section 3.2.6. Selective Mitigation Measure 7 would be applied for Military Training (described in Section 3.2.6) to allow for tower design modification to meet the requirements of NWSTF Boardman and the FAA.

The FAA requires utility line separation from runways and horizontal and conical zones for the safety of the planes and helicopters using the airports. To determine whether the B2H Project would be a hazard to these operations, the Applicant would conduct an obstruction evaluation/airport airspace analysis in

coordination with the FAA. This would occur before the ROD is issued. The obstruction evaluation/airport airspace analysis would determine whether a tower or span exceeds or is within any of the criteria identified by the FAA. To conduct an obstruction evaluation/airport airspace analysis, the towers and spans for the selected route are processed through the Notice Criteria Tool and the FAA would notify the Applicant of which towers and/or spans are required to file Form 7460-1, Notice of Proposed Construction or Alteration. The Applicant would file Form 7460-1 and the FAA would provide a determination of no hazard or hazard to airspace. If the tower were determined a hazard, steps would be taken to mitigate the hazard. The FAA will issue either a Determination of No Hazard to Air Navigation or a Notice of Presumed Hazard. The FAA also would outline any conditions (i.e., marking, lighting, etc.) required of the Applicant during construction in the determination letter.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would not affect the safety, use, operation or maintenance of existing airports, airstrips or heliport facilities. Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative; however, these design options would affect a much smaller area.

East of Bombing Range Road Alternative

Highways, Roads, Bridges, Railroads

Effects on highways, roads, bridges and railroads would be similar to those discussed for the Applicant's Proposed Action Alternative except that the proposed transmission line would be constructed outside the east boundary of Bombing Range Road. The transmission line would be constructed outside of the Bombing Range Road right-of-way and would not affect traffic along this roadway.

Airports, Airstrips, and Heliport

Effects on airports, airstrips, and heliports would be the same as those discussed for the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Highways, Roads, Bridges, Railroads

Effects on highways, roads, bridges and railroads would be similar to those discussed for the Applicant's Proposed Action Alternative along Bombing Range Road. The types of impacts on the transportation system along the Southern Route Alternative would be similar to those discussed for the Applicant's Proposed Alternative. However, the extent of impacts would be less because there are fewer highways, roads, bridges and railroad facilities located along Links 1-36, 1-38, 1-62,1-64, and 1-66.

Airports, Airstrips, and Heliport

Effects on airports, airstrips, and heliports would be the same as those discussed for the Applicant's Proposed Action Alternative.

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would not affect the safety, use, operation or maintenance of existing airports, airstrips or heliport facilities. Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative; however, these design options would affect a much smaller area.

West of Bombing Range Road – Southern Route Alternative

Highways, Roads, Bridges, Railroads

Effects on highways, roads, bridges and railroads would be the same as those discussed for the Applicant's Proposed Action Alternative along Bombing Range Road. The types of impacts on transportation system along the Southern Route Alternative portion would be similar to those discussed for the Applicant's Proposed Alternative. However, the extent of impacts would be less because there are fewer highways, roads, bridges and railroad facilities located along Links 1-36, 1-38, 1-62,1-64, and 1-66.

Airports, Airstrips, and Heliport

Effects on airports, airstrips, and heliports would be the same as those discussed for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Design Options 1, 2, and 3 would not affect the safety, use, operation or maintenance of existing airports, airstrips or heliport facilities. Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative, however, these design options would affect a much smaller area.

Longhorn Alternative

Highways, Roads, Bridges, Railroads

Effects on highways, roads, bridges and railroads would be similar to those discussed for the Applicant's Proposed Action Alternative with the exception of Bombing Range Road. The Longhorn Alternative would not parallel Bombing Range Road. Instead, it will travel south avoiding agricultural land crossing county and other roads. Impacts associated with these types of transportation facility crossings are described in Effects Common to All Alternatives section above. The Longhorn Alternative joins the same alignment as the Applicant's Proposed Action Alternative at Link 1-15. From Link 1-15 onward, the effects would be the same as those discussed for the Applicant's Proposed Action Alternative.

Airports, Airstrips, and Heliport

Effects on airports, airstrips, and heliports would be the same as those discussed for the Applicant's Proposed Action Alternative.

Interstate 84 Alternative and Variations

Highways, Roads, Bridges, Railroads

Effects on highways, roads, bridges would be similar to those discussed under Effects Common to All Alternatives. Interstate I-84 Alternative parallels Interstate 84 for approximately 35 miles located between roadway right-of-way and the existing agricultural lands. The route crosses two highway interchanges along I-84 (south of Hermiston and again south of Stanfield). Coordination would be necessary between the Applicant and ODOT to ensure appropriate siting of towers, compliance with FHWA and ODOT safety requirements, and acquisition of encroachment permits, as needed.

The B2H Project would be constructed outside of the road right-of-way and would not have a long-term effect on traffic or congestion.

Short-term effects on highways, roads and bridges would be the same as those discussed under Effects Common to All Alternatives section.

Impacts on railroad facilities would be the same as those discussed for the Applicant's Proposed Alternative. However, after exiting the proposed Longhorn Substation, the Interstate 84 route parallels the railroad between the railroad right-of-way and the highway right-of-way. The Interstate 84 Alternative crosses the railroad once more near Echo, Oregon. Coordination of scheduling with the railway operator during construction (specifically stringing of conductors) could avoid curtailment of railway operations. In addition, induction in the rails, especially during a short-circuit event, can cause risk to persons along the rail and to signal systems. Selective Mitigation Measure 8 would be applied to address potential interruptions and safety concerns through coordination with Union Pacific prior to construction.

Effects on highways, roads, bridges and railroads for Variation S1-A1 and S1-A2 would be the same as those discussed for the Interstate 84 Alternative.

Airports, Airstrips, and Heliport

Effects on airports, airstrips, and heliports would be the same as those discussed for the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

Highways, Roads, Bridges, Railroads

Effects on highways, roads, bridges and railroads would be the same as those discussed for the Interstate 84 Alternative until the route reaches Pilot Rock, Oregon. The Interstate 84 Southern Route Alternative deviates from just west of Pilot Rock and joins the Applicant's Proposed Action Alternative to Southern Route. From this point onward the effects on highways, roads, and bridges would be the same as those discussed for the Applicant's Proposed Action Alternative to Southern Route.

Airports, Airstrips, and Heliport

Effects on airports, airstrips, and heliports would be the same as those discussed for the Applicant's Proposed Action Alternative.

Conclusions

No high or moderate impacts on transportation are predicted in Segment 1. For any alternative route selected, coordination between the Applicant and ODOT and Union Pacific would be required to ensure compliance with safety requirements, and acquisition of encroachment permits, as needed. However, construction of the B2H Project along Bombing Range Road would require additional coordination with NWSTF Boardman and FAA.

SEGMENT 2—BLUE MOUNTAINS

Table 3-386 presents the residual impacts on all alternative routes and route variations in Segment 2.

Table 3-386. Transportation Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)		
		Federal Highway	State Highway	County Road	Rail	Landing Strip	High	Moderate	Low
Applicant's Proposed Action	33.8	0.3	0.3	0.0	0.2	0.0	0.0	0.0	0.8
Variation S2-A1	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-A2	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.3*	*0.1*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.6*
Variation S2-F2	*12.2*	*0.1*	*0.1*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.4*
Glass Hill	33.7	0.3	0.3	0.0	0.2	0.0	0.0	0.0	0.8
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	0.6	0.2	0.0	0.2	0.0	0.0	0.0	1.0

Table Note: There are no airports within the 1 mile study corridor this table only reports on landing strips. Local and other roads are not analyzed through the resource inventory process because the initial and residual impacts are anticipated to be low.

Applicant's Proposed Action Alternative

Highways, Roads, Bridges, Railroads

Effects on the transportation system would be similar to those described in Effects Common to All Alternatives section. The Applicant's Proposed Action Alternative would result in a low level of impacts on highways, roads, bridges, and railroad facilities. Specifically, the Applicant's Proposed Action Alternative and Variation S2-F1, and Variation S2-F2 cross Interstate 84, State Highway 237 and the Union Pacific Railroad just south of Union, Oregon (Link 2-70 and 2-85). Selective Mitigation Measure 8

would be applied to ensure compliance with requirements set forward by ODOT, local transportation agencies and the Federal Railroad Administration (FRA) regarding construction activities and crossing of transportation facilities.

All other variations to the Applicant's Proposed Action Alternative would not cross any major transportation facilities. Potential impacts on unnamed private or local roads would similar to those described in Effects Common to All Alternatives section.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 2.

Glass Hill Alternative

Highways, Roads, Bridges, Railroads

The types of impacts associated for the Glass Hill Alternative would be similar to those identified for the Applicant's Proposed Action Alternative. However, the Glass Hill Alternative (Link 2-40) is located three miles west of Morgan Lake until it joins the same alignment as the Applicant's Proposed Action Alternative at Link 2-50, and continues through Segment 2. From Link 2-52 on, impacts would be the same as those discussed for the Applicant's Proposed Action Alternative.

Variation S2-D1 and Variation S2-D2 would not cross any major transportation facilities. Potential impacts on unnamed private or local roads would be the same as those described in Effects Common to All Alternatives section.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 2.

Mill Creek Alternative

Highways, Roads, Bridges, Railroads

Impacts would be similar to those discussed for the Applicant's Proposed Action Alternative. However, the Mill Creek Alternative crosses Interstate 84 three times south of La Grande. It also crosses State Highway 237 north of North Power, Oregon. Although the Mill Creek Alternative would result in more crossings of existing transportation facilities, impacts are anticipated to be low due to the fact that it is collocated with an existing 230-kV transmission line. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT, local transportation agencies and FRA regarding construction activities and crossing of transportation facilities.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 2.

Conclusions

No high or moderate impacts on transportation are predicted in Segment 2. For any alternative route selected, coordination between the Applicant, ODOT, and Union Pacific would be required to ensure compliance with safety requirements, and acquisition of encroachment permits, as needed. There is no discernable difference in impacts on transportation among the alternatives considered for Segment 2.

SEGMENT 3—BAKER VALLEY

Table 3-387 presents the residual impacts on all alternative routes and route variations in Segment 3.

Table 3-387. Transportation Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)		
		Federal Highway	State Highway	County Road	Rail	Landing Strip	High	Moderate	Low
Applicant's Proposed Action	55.2	0.3	0.4	0.2	2.3	0.0	0.0	0.0	3.0
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*
Variation S3-B1	*13.9*	*0.0*	*0.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S3-B2	*14.4*	*0.0*	*0.3*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S3-B3	*14.7*	*0.0*	*0.3*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S3-B4	*14.3*	*0.0*	*0.3*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S3-B5	*14.0*	*0.0*	*0.3*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*
Variation S3-C1	*21.1*	*0.3*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*	*0.0*	*2.4*
Variation S3-C2	*21.7*	*0.3*	*0.0*	*0.0*	*2.2*	*0.0*	*0.0*	*0.0*	*2.3*
Variation S3-C3	*21.1*	*0.7*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*	*0.0*	*2.6*
Variation S3-C4	*21.4*	*0.7*	*0.0*	*0.0*	*2.3*	*0.0*	*0.0*	*0.0*	*2.6*
Variation S3-C5	*21.0*	*0.3*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.3*
Variation S3-C6	*24.7*	*0.3*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.0*	*0.3*
Flagstaff A	55.3	0.3	0.4	0.2	2.3	0.0	0.0	0.0	0.3
Timber Canyon	70.3	0.3	0.4	0.0	1.9	0.0	0.0	0.0	2.4[1]
Flagstaff A – Burnt River Mountain	55.3	0.7	0.3	0.3	2.3	0.0	0.0	0.0	3.2
Flagstaff B	56.0	0.3	0.3	0.3	2.3	0.0	0.0	0.0	3.0
Flagstaff B – Burnt River West	55.7	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.9
Flagstaff B – Durkee	59.6	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.9

Table Note: [1]U.S. Forest Service development roads are not included in this count.

Applicant's Proposed Action Alternative

Highways, Roads, Bridges, Railroads

Effects on the transportation system would be similar to those described in Effects Common to All Alternatives section. The Applicant's Proposed Action Alternative would result in a low level of impacts

on highways, roads, bridges, and railroad facilities. Specifically, the Applicant's Proposed Action Alternative crosses Oregon State Route 203 and 86 east of Baker City, Oregon (MV-13). The route then continues to closely parallel the north side of Interstate 84 for approximately 28 miles. The alignment crosses Interstate 84 near the unincorporated town of Weatherby, Oregon and then parallels the south side of Interstate 84 for 4 miles to the end of Segment 3 (near Dixie, Oregon). The Applicant' Proposed Action crosses the Union Pacific Railroad twice just north of Durkee, Oregon and again south of Weatherby, Oregon. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT, local transportation agencies and FRA regarding construction activities and crossing of transportation facilities.

Variation S3-B1, Variation S3-B2, Variation S3-B3, Variation S3-B4, and Variation S3-B5 cross Oregon State Route 203 and 83. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT, local transportation agencies and FRA regarding construction activities and crossing of transportation facilities. The types of impacts would be similar those described in Effects Common to All Alternatives section.

Variation S3-C3, Variation S3-C4, Variation S3-C5, and Variation S3-C6 cross Interstate 84, Old U.S. 30 and the Union Pacific Railroad where these facilities intersect north of Durkee, Oregon. These variations also cross Burnt River Canyon Lane and other small unnamed roads in the area. The routes cross Interstate 84 again and the Union Pacific Rail Road from west to east at the unincorporated town of Weatherby, Oregon before it joins the Applicant's Proposed Action Alternative. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT, local transportation agencies and FRA regarding construction activities and crossing of transportation facilities. Variation S3-C3, Variation S3-C5, and Variation S3-C6 would require more coordination with transportation management agencies due to the increased number of transportation facility crossings.

The types of impacts from all other variations would be similar to those described in Effects Common to All Alternatives section.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 3.

Flagstaff A Alternative

Highways, Roads, Bridges, Railroads

Impacts on highways, roads, bridges and railroads from Flagstaff A Alternative would be similar to those discussed for the Applicant's Proposed Action Alternative. However, the Flagstaff A Alternative is located farther east (Links 3-31 to 3-47) and impacts would occur in a slightly different location.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 3.

Timber Canyon Alternative

Highways, Roads, Bridges, Railroads

The Timber Canyon Alternative would travel through the Wallowa-Whitman National Forest. GIS analysis for the study corridor identified approximately 18 national forest development roads that could potentially be crossed by the Timber Canyon Alternative. Crossings would be subject to final design and the terms and conditions of the USFS. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT, USFS, local transportation agencies and FRA regarding construction activities and crossing of transportation facilities.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 3.

Flagstaff A – Burnt River Mountain Alternative

Highways, Roads, Bridges, Railroads

Impacts on highways, roads, bridges and railroads from the Flagstaff A – Burnt River Mountain Alternative would be similar to those described for the Applicant's Proposed Action Alternative until Pleasant Valley, Or (Link 3-56). The Flagstaff A Alternative then crosses Interstate 84, Old U.S. 30 and the Union Pacific Railroad where these facilities intersect north of Durkee, Oregon. This route also crosses Burnt River Canyon Lane and then continues farther west to collocate with an existing 230-kV transmission line and does not cross another major transportation routes. The Flagstaff A Alternative route crosses Interstate 84 and the Union Pacific Rail Road fewer times than the Applicant's Proposed Action Alternative. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT, local transportation agencies and FRA regarding construction activities and crossing where the route does cross a transportation facility.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 3.

Flagstaff B Alternative

Highways, Roads, Bridges, Railroads

Impacts on highways, roads, bridges and railroads from the Flagstaff B Alternative would be similar to those described for the Applicant's Proposed Action Alternative. However, the Flagstaff B Alternative is located west (Links 3-37 to 3-47) of the Applicant's Proposed Action Alternative and therefore, impacts would occur in a slightly different location.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 3.

Flagstaff B – Burnt River West Alternative

Highways, Roads, Bridges, Railroads

Impacts on highways, roads, bridges and railroads from the Flagstaff B – Burnt River West Alternative would be the similar to those described for the Flagstaff A – Burnt River Mountain Alternative. The Flagstaff B- Burnt River Alternative is located very closely to Flagstaff A – Burnt River Mountain Alternative; however, it is located slightly farther east (Link 3-73).

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 3.

Flagstaff B– Durkee

Highways, Roads, Bridges, Railroads

Impacts on highways, roads, bridges and railroads from the Flagstaff B – Durkee Alternative would be the similar to those described for the Flagstaff A – Burnt River Mountain Alternative. The Flagstaff B – Durkee Alternative is longer and located farther west (Links 3-74 and 3-90). The Flagstaff B- Durkee alternative would require more coordination with transportation management agencies due to the increased length and subsequent number of small road crossings.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 3.

Conclusions

No high or moderate impacts on transportation are predicted in Segment 3. on transportation are predicted in Segment 1. For any alternative route selected, coordination between the Applicant, ODOT, and Union Pacific would be required to ensure compliance with safety requirements, and acquisition of encroachment permits, as needed. The alternative routes in Segment 3 are located in close proximity; therefore, there is no discernable difference in impacts on the transportation system. An exception would be the Timber Canyon Alternative, which crosses approximately 18 national forest development roads not crossed by any other alternative route in Segment 3.

SEGMENT 4—BROGAN

Table 3-388 presents the residual impacts on all alternative routes and route variations in Segment 4.

Table 3-388. Transportation Inventory Data for Segment 4—Brogan

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)		
		Federal Highway	State Highway	County Road	Rail	Landing Strip	High	Moderate	Low
Applicant's Proposed Action	40.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Tub Mountain South	40.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Willow Creek	34.6	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1

Applicant's Proposed Action Alternative

Highways, Roads, Bridges, Railroads

The Applicant's Proposed Action Alternative would result in a low level of impacts on highways, roads and bridges. No railroad facilities are crossed. The Applicant's Proposed Action Alternative and Variation S4-A1 pass through a relatively undeveloped area and cross U.S. Highway 26 approximately 4 miles east of Brogan. The remainder of the Applicant's Proposed Action Alternative does not cross any major transportation facilities. Potential impacts on unnamed private or local roads would be similar to those described in Effects Common to All Alternatives section. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT and local transportation agencies regarding construction activities and crossing of transportation facilities.

Variation S4-A2 and Variation S4-A3 would be located slightly east of the Applicant's Proposed Action Alternative to allow for colocation with an existing 138-kV transmission line. These variations would not cross any major transportation facilities. Potential impacts on unnamed private or local roads would similar to those described in Effects Common to All Alternatives section.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports crossed by the Applicant's Proposed Action Alternative.

Tub Mountain South Alternative

Highways, Roads, Bridges, Railroads

The Tub Mountain South Alternative parallels Interstate 84 for approximately 15 miles then drops south through the developed area of Willow Creek. The Tub Mountain South Alternative crosses small local roads as well as U.S. Highway 26. Selective Mitigation Measure 8 would be applied to ensure

compliance with requirements set forward by ODOT and local transportation agencies regarding construction activities and crossing of transportation facilities.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports crossed by the Tub Mountain South Alternative.

Willow Creek Alternative

Highways, Roads, Bridges, Railroads

Impacts on highways, roads, bridges and railroads from Willow Creek Alternative would be similar to those described for the Applicant's Proposed Action Alternative. However, the Willow Creek Alternative crosses U.S. Highway 26 about 1.5 miles northwest of Jamieson. The Willow Creek Alternative crosses developed areas small local roads. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT and local transportation agencies regarding construction activities and crossing of transportation facilities.

Airports, Airstrips, and Heliport

The Willow Creek Alternative would result in a moderate level of impact on an existing airstrip. The Willow Creek Alternative crosses the Gum Creek airstrip and, if constructed, would interfere with use of the airstrip. It would be necessary for the Applicant to coordinate with the airstrip operator during final design to avoid any interference with airstrip operation. Selective Mitigation Measure 7 would be applied to address site-specific constraints to allow for continued use of this airstrip and compliance with Oregon Department of Aviation requirements. Modifications could include modification of tower height, modification of tower leg lengths or modification to tower placement to allow ongoing operation of this airstrip.

Conclusions

No high or moderate impacts on transportation in Segment 4. For any alternative route selected, coordination between the Applicant, ODOT, and Union Pacific would be required to ensure compliance with safety requirements, and acquisition of encroachment permits, as needed. There is no discernable difference in impacts on transportation among the alternatives considered for Segment 4, except for the Willow Creek Alternative. The Willow Creek Alternative would result in more transportation facility crossings because it crosses a populated area. In addition, Willow Creek Alternative crosses the existing Gum Creek airstrip.

SEGMENT 5—MALHEUR

Table 3-389 presents the residual impacts on all alternative routes and route variations in Segment 5.

Table 3-389. Transportation Inventory Data and Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)		
		Federal Highway	State Highway	County Road	Rail	Landing Strip	High	Moderate	Low
Applicant's Proposed Action	40.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Variation S5-A1	7.4	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	7.4	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Malheur S	43.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Malheur A	43.1	0.1	09.0	0.0	0.0	0.0	0.0	0.0	0.1

Applicant's Proposed Action Alternative

Highways, Roads, Bridges, Railroads

The Applicant's Proposed Action Alternative, Malheur S Alternative, Malheur A Alternative and all variations would result in a low level of impacts on highways, roads and bridges. No railroad facilities are crossed. Potential impacts on unnamed private or local roads would similar to those described in Effects Common to All Alternatives section. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT and local transportation agencies regarding construction activities and crossing of transportation facilities.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 5.

Conclusions

No high or moderate impacts on transportation are predicted in Segment 5. For any alternative route selected, coordination between the Applicant, ODOT, and Union Pacific would be required to ensure compliance with safety requirements, and acquisition of encroachment permits, as needed. There is no discernable difference in impacts on transportation among the alternatives considered for Segment 5.

SEGMENT 6—TREASURE VALLEY

Table 3-390 presents the residual impacts on all alternative routes and route variations in Segment 6.

Table 3-390. Transportation Inventory Data and Residual Impacts for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Resource Inventory (miles crossed)					Residual Impacts (miles)		
		Federal Highway	State Highway	County Road	Rail	Landing Strip	High	Moderate	Low
Applicant's Proposed Action	28.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Variation S6-B2	*14.1*	*0.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*

Applicant's Proposed Action Alternative

Highways, Roads, Bridges, Railroads

The Applicant's Proposed Action Alternative and all variations would result in a low level of impacts on highways, roads and bridges. No railroad facilities are crossed. Potential impacts on unnamed private or local roads would be the same as those described in Effects Common to All Alternatives section. Selective Mitigation Measure 8 would be applied to ensure compliance with requirements set forward by ODOT, IDT, and local transportation agencies regarding construction activities and crossing of transportation facilities.

Airports, Airstrips, and Heliport

There are no airports, airstrips or heliports located within the study corridor for Segment 6.

Conclusions

No high or moderate impacts on transportation are predicted in Segment 6. For any alternative route selected, coordination between the Applicant, ODOT, and Union Pacific would be required to ensure compliance with safety requirements, and acquisition of encroachment permits, as needed. There is no discernable difference in impacts on transportation among the alternative routes considered for Segment 6.

3.2.10 LANDS WITH WILDERNESS CHARACTERISTICS

3.2.10.1 INTRODUCTION

This section discusses BLM-administered lands that have been documented to contain wilderness characteristics. In general, these areas have been identified as lands that are at least 5,000 contiguous acres, are generally natural in appearance, provide outstanding opportunities for either solitude or primitive and unconfined types of recreation, and may contain supplemental values (i.e., scientific, educational, scenic, or historical values).

3.2.10.2 REGULATORY FRAMEWORK

FEDERAL

Federal Land Policy and Management Act of 1976 (43 U.S.C. 1711-1712)

Pursuant to Section 201 of the FLPMA, the BLM is required to maintain, on a continuing basis, an inventory of all public lands and the lands' resources and other values. This inventory requirement includes maintaining information regarding wilderness characteristics. Section 201 also provides that the preparation and maintenance of the inventory will not change or prevent change of the management or use of the lands.

Section 202 of the FLPMA requires the BLM to rely on the resource inventories in the development and revision of land-use plans, including inventory information regarding wilderness characteristics. The wilderness resource, including lands with wilderness characteristics, is one of the resources that the BLM manages under the multiple-use and sustained-yield direction contained in Section 202 of the FLPMA.

Bureau of Land Management Manual 6310 – Conducting Wilderness Characteristics Inventory on Bureau of Land Management Lands (Public)

This manual states that for lands with wilderness characteristics, "This policy contains the BLM guidance and general procedure for conducting wilderness characteristics inventories under Section 201 of FLPMA and supersedes all previous guidance on this topic." Under this policy, the BLM will conduct inventories of public lands for the presence or absence of wilderness characteristics, by considering the "validity of proposed boundaries of the area(s), the existence of wilderness inventory roads and other boundary features, the size of the area(s), and the presence or absence of wilderness characteristics." Once potential lands with wilderness characteristics have been identified, a complete inventory is performed, where the BLM considers the size, naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation, as well as any supplemental values. If an inventory unit meets all of these criteria, the area is documented as containing wilderness characteristics (BLM 2012).

Only lands with wilderness characteristics units crossed by the B2H Project right-of-way are addressed in the analysis because BLM Manual 6310 directs that the effects of activities outside an area do not influence outstanding opportunities for solitude determinations unless they are pervasive and omnipresent (BLM 2012).

Bureau of Land Management Manual 6320 – Considering Lands With Wilderness Characteristics in the Bureau of Land Management Land Use Planning Process (Public)

This manual establishes BLM policy on considering lands with wilderness characteristics in land-use plans and land-use plan amendments and revisions in accordance with the FLPMA and other applicable authorities. By using the land-use planning process, the BLM can determine how to manage the lands with wilderness characteristics as part of the BLM's multiple-use mandate. As part of the land-use planning process, a suite of management actions with allowable uses and restrictions are considered to protect wilderness characteristics (i.e., right-of-way exclusion or avoidance area) (BLM 2012).

Bureau of Land Management Resource Management Plans

The potential effects of a proposed action on lands with wilderness characteristics and compliance with any management-level decision (established in BLM RMPs) for the units must be considered by the BLM when making project-level decisions.

In addition, for lands within the Vale District that are within the planning area for the SEORMP, a court-approved settlement agreement also sets out certain requirements that BLM must follow until BLM completes an RMP amendment for the SEORMP (Settlement Agreement Between ONDA, Committee for the High Desert, WWP, and BLM (June 7, 2010)). Until BLM complete the RMP amendment for the SEORMP, the settlement agreement precludes the BLM from approving any surface-disturbing activity on lands that the BLM has identified as having wilderness characteristics if the BLM finds that the project would either diminish the size of the inventory unit or cause the entire inventoried unit to no longer meet the criteria for wilderness character (ONDA v. Bureau of Land Management 2010).

3.2.10.3 Issues Identified for Analysis

In addition to the issues that must be considered as required by applicable laws or regulations, the potential for effects on lands with wilderness characteristics was identified as an issue for analysis during scoping.

3.2.10.4 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.3 and Section 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on lands with wilderness characteristics.

Inventory

The BLM completed inventory updates for the Malheur Field Office as part of the land-use planning process for amending its RMP (the SEORMP) to consider those units that have been documented to contain wilderness characteristics. In addition, updated inventories are available for the rest of the study corridor. No other lands containing wilderness characteristics are crossed by any of the alternative routes (including the Idaho portion). No additional citizens' inventories or new information have been

received during preparation of this EIS. Lands with wilderness characteristics units occurring within the 1-mile-wide study corridor (i.e., 0.5 mile on either side of the reference centerline for the alternatives and route variations) are discussed in this section. Lands with wilderness characteristics units only occur in the study corridor for the alternatives and route variations in Segment 5.

No wilderness areas or Wilderness Study Areas (WSAs) occur within the study corridor for the alternatives or route variations for any segment.

DATA SOURCES

The analysis in this section is based on the BLM inventory reports for each unit in the study corridor.

In February 2004, a citizen group provided the BLM Vale District with additional information in an inventory report containing maps, photos, and photo logs for 42 proposed inventory units of critical environmental concern covering more than 2.2 million acres of public land in the planning area (ONDA 2004a, 2004b, 2004c). The group later submitted supplemental sets of digital photos, photo logs, and GIS spatial data with additional or edited versions of their original submission.

From 2007 to 2012 the BLM Vale District conducted wilderness inventory updates for public lands outside of designated WSAs (approximately 1.3 million acres in the planning area), following the current inventory guidance (BLM 2007a, 2007b, 2007c, 2007d). Interdisciplinary teams reviewed the existing wilderness inventory information contained in the BLM's wilderness inventory files, previously published inventory findings (BLM 1980a, 1980b), and citizen-provided wilderness information (ONDA 2007a, 2007b, 2007c).

When conducting inventory updates, the BLM identified preliminary boundaries for wilderness characteristics inventory units and reviewed existing pertinent information within the unit to determine whether data updates or additional field inventory information was needed. Updates and inventories were completed prior to conducting an evaluation of a given unit. Inventory unit boundaries principally are formed by public land boundaries and roads. The interdisciplinary teams made final route and boundary determinations and, subsequently, evaluated wilderness characteristics in each unit. BLM staff compiled the new and existing photography, resource information, interdisciplinary team discussion records, and route information into individual unit records. With this information, the interdisciplinary teams then made draft wilderness characteristic determinations and provided these to BLM managers for final concurrence. The lands with wilderness characteristics inventories completed by the BLM comply with BLM Manual 6310. Final wilderness characteristics determinations have been made available to the public on the BLM Vale District website at http://www.blm.gov/or/districts/vale/plans/wce/malheur-index.php. In addition, hard copies of the final wilderness characteristics determinations are contained in the BLM Vale District files and have been made available to interested parties on request. Pursuant to 40 CFR Section 1502.21, the BLM hereby incorporates, by reference, its wilderness inventory update documentation into this analysis and summarizes below the two units that could be affected. Through the SEORMP plan amendment process, the BLM will determine whether to manage the units to administratively protect wilderness characteristics.

Analysis Area

The analysis area for lands with wilderness characteristics is a 1-mile-wide study corridor (i.e., 0.5 mile on either side of the reference centerline for the alternatives and route variations). In addition, environmental consequences for lands with wilderness characteristics located within 250 feet of centerline of the alternative routes are identified, where appropriate. This width represents the edge of the proposed transmission line right-of-way, which would become a new wilderness inventory boundary (as developed rights-of-way are treated similarly to roads). The study corridor also includes sites for substations, communication sites, multi-use areas, and fly yards.

Impact Assessment and Mitigation Planning

Criteria for Assessing Level of Impacts

Criteria for determining the level of impacts were not developed specifically for lands with wilderness characteristics to assess impacts. Rather, the impact criteria developed for vegetation and recreation were used to assess the level of impacts on wilderness characteristics (refer to Section 3.2.3 and Section 3.2.8).

Effects Analysis

A qualitative assessment of the potential effects on lands with wilderness characteristics was conducted for each unit crossed by the alternative routes and route variations. Also, if applicable, conformance with land-use planning objectives for the units as established in the relevant SEORMP was assessed. Refer to Section 3.2.6 for further discussion of the SEORMP.

Mitigation Planning and Effectiveness

The effectiveness of applying selective mitigation measures developed for vegetation and recreation resources would avoid, minimize, or reduce over time the surface disturbance associated with B2H Project construction, access, and facility placement, as well as ensure that the alignment would not further encroach onto the boundaries of lands with wilderness characteristics units. Relevant selective mitigation measures include Selective Mitigation Measure 5 (Minimize Vegetation Clearing for Operational Clearances), Selective Mitigation Measure 6 (Limit New or Improved Accessibility to Areas Previously Inaccessible), Selective Mitigation Measure 7 (Tower Design Modification), and Selective Mitigation Measure 8 (Span and/or Avoid Sensitive Features) (refer to Table 2-13). It should be noted that with regards to lands with wilderness characteristics Mitigation Measure 8 would be applied to avoid sensitive features rather than spanning. The effectiveness of applying these selective mitigation measures includes minimizing B2H Project effects on resources that contribute to the area's wilderness characteristics by consolidating and minimizing surface disturbances during B2H Project construction, access, and facility placement, as well as ensuring that the alignment would not further encroach into areas not currently affected by the B2H Project as disclosed in this EIS. Applying these selective mitigation measures to units that have been documented to contain wilderness characteristics would allow for relevant BLM field offices to use discretion at the local level to ensure retention of wilderness characteristics to the greatest practical extent.

The BLM may require compensatory mitigation to offset impacts on lands with wilderness characteristics where impacts cannot be effectively avoided, in accordance with the Department of the Interior's Secretarial Order 3330 and the BLM's Draft Regional Mitigation Manual (Draft Manual Mitigation Strategy 1794 "Regional Mitigation Manual" (BLM 2013a) and consistent with the CEQ's NEPA regulations, 40 CFR 1508.20). Secretarial Order 3330 provides a policy that directs the Department of the Interior to '"seek ways to offset or compensate for those impacts [that cannot be avoided or effectively minimized] to ensure the continued resilience and viability of our natural resources over time" (Secretary of the Interior 2013). BLM Draft Manual MS 1794 also reflects the BLM's policy (interim) commitment to "consider mitigation outside of the area of impact when it is not feasible or practical to mitigate impacts to an acceptable level in the same area as the use-authorization" (BLM 2013b).

Compensatory mitigation for impacts on lands with wilderness characteristics may include funding to maintain or enhance lands with wilderness characteristics through resource restoration and other related activities, funding of related interpretation and educational programs, or other appropriate projects at the discretion of the field manager.

Appendix C of this EIS contains a Mitigation Framework. The Mitigation Framework (1) establishes how avoidance and minimization have eliminated and/or reduced impacts; (2) identifies unavoidable remaining resource effects that meet criteria for warranting compensatory mitigation; (3) provides a framework for how the appropriate level and type of compensatory mitigation will be determined for those resource effects; and (4) identifies the types of compensatory mitigation measures or projects that could be applied in specific areas to offset the unavoidable remaining impacts.

Upon selection of the final route in the ROD and following final engineering and design, the compensatory mitigation plan will update, as needed, the direct and indirect impacts based on an engineered and designed alignment, and will identify a suite of site-specific compensatory mitigation options for selection and implementation under the review and guidance of the cooperating agencies. The final detailed compensatory mitigation plan must be reviewed by the cooperating agencies and a recommendation will be made to the Authorized Officer for approval prior to any issuance of Notices to Proceed.

3.2.10.5 Affected Environment

Segment 1—Morrow-Umatilla

There are no lands with wilderness characteristics units in the study corridor in Segment 1.

Segment 2—Blue Mountains

There are no lands with wilderness characteristics units in the study corridor in Segment 2.

Segment 3—Baker Valley

There are no lands with wilderness characteristics units in the study corridor in Segment 3.

SEGMENT 4—BROGAN

There are no lands with wilderness characteristics units in the study corridor in Segment 4.

SEGMENT 5—MALHEUR

Table 3-391 lists lands with wilderness characteristics units located in the 1-mile-wide study corridor for the alternatives and route variations in Segment 5 (refer to MV-20).

Table 3-391. Lands with Wilderness Characteristics Units within the Study Corridor for Segment 5—Malheur Area

Alternative Route	Lands with Wilderness Characteristics
Applicant's Proposed Action	Double Mountain
Variation S5-A1	*Double Mountain*
Variation S5-A2	*Double Mountain*[1]
Variation S5-B1	*None*
Variation S5-B2	*None*
Malheur S	Double Mountain Broken Rim Sourdough Mountain
Malheur A	Double Mountain Broken Rim Sourdough Mountain Board Corral Mountain Sand Hollow Burnt Mountain

Table Note: [1]The Double Mountain Unit is crossed by the centerline of Variation S5-A2.

Several lands with wilderness characteristics units are located in the study corridor for the alternatives and route variations in Segment 5. However, only the Double Mountain Unit is crossed by the reference centerline of a route variation analyzed in Segment 5 (refer to Table 3-392). Both Variation S5-A1 and Malheur S Alternative were developed to avoid lands with wilderness characteristics.

Table 3-392. Lands with Wilderness Characteristics Units Crossed by Alternative Route or Route Variation in Segment 5—Malheur

Alternative Route	Total Length (miles)	Resource Inventory (miles)	Miles of Unit Crossed by Alternative Route or Route Variation
Applicant's Proposed Action	40.4	40.4	0
Variation S5-A1	*7.4*	*7.4*	*0*
Variation S5-A2	*7.4*	*7.4*	*4.7*
Variation S5-B1	*2.5*	*2.5*	*0*
Variation S5-B2	*2.8*	*2.8*	*0*
Malheur S	43.5	43.5	0
Malheur A	43.1	43.1	0

Applicant's Proposed Action Alternative

Table 3-393 summarizes information on the units of inventoried wilderness characteristics located within the 1-mile-wide study corridor of the Applicant's Proposed Action Alternative.

Because lands within the Vale District are within the planning area for the SEORMP, the BLM is precluded from approving any surface-disturbing activity on lands that the BLM has identified as having wilderness characteristics if the BLM finds that the B2H Project would either diminish the size of the inventory unit or cause the entire inventoried unit to no longer meet the criteria for wilderness character (ONDA v. Bureau of Land Management 2010).

Table 3-393. Lands with Wilderness Characteristics Units in the Study Corridor for the Applicant's Proposed Action Alternative in Segment 5—Malheur

Unit Identification/Name	Approximate Unit Size	Meets Criteria for Lands with Wilderness Characteristics	Sufficient Size	Naturalness	Solitude	Primitive and Unconfined Recreation	Supplemental Values	Crossed by Alternative Route Centerline
Double Mountain	28,181	Yes	Yes	Yes	Yes	No	Yes	Yes, crossed by Variation S5-A2

Table Source: BLM 2009a

Double Mountain Unit

The Double Mountain Unit (OR-034-040) is approximately 28, 181 acres and is bounded by BLM roads on the south of the unit's northeast sector, and by private lands on its north boundary. The Double Mountain Unit is documented to contain wilderness characteristics and meets minimum size and naturalness criteria, as well as provides outstanding opportunities for solitude. Terrain of the unit consists of the north-south oriented watershed of Sagebrush Creek with drainages and moderate to steep rising (500 feet) terrain with a grouped complex of peaks in the unit's southwest portion. There also is a mesa in the unit's northwest portion. Elevation in the unit ranges from 2,420 to 3,900 feet and vegetation consists of predominately sagebrush community. Dispersed recreational opportunities in the unit are not outstanding in quality. Primary primitive recreation opportunities within the unit include hunting of common upland and big game, day hiking, horseback riding, and general sightseeing and photography. Three BLM special status plant species are known to occur within the unit: Cronquists' stickseed, Biddle's lupine, and Cusick's chaenactis.

Citizen Proposed Study Area Associated with the Double Mountain Unit

In February 2004, the Vale District received the ONDA's evaluation of wilderness characteristics for the 26,155-acre Sagebrush Gulch. Because the BLM documents human developments and man-made features within the unit, the BLM unit boundary features differ from the ONDA boundary features. The

BLM inventory also differs from the ONDA inventory regarding the opportunity for outstanding recreation activities and confirmed presence of certain wildlife species. The conclusion of the BLM's inventory and citizen proposal for naturalness of the unit was different because consideration of the 27 vehicle routes along the Owyhee River was not made possible because of the timing of the land transfer from Reclamation to the BLM. In addition, the ONDA stated that habitat may be present for sensitive species; however, some of these species were not considered sensitive by the ODFW, BLM, or USFWS. Inventory sheets documenting these findings are available on the BLM website: http://www.blm.gov/or/districts/vale/plans/files/DoubleMountain_OR-034-040_ALL.pdf.

Variations S5-A1 and S5-A2

The conditions of the existing environment are the same as those identified for the Applicant's Proposed Action Alternative.

Variations S5-B1 and S5-B2

There are no lands with wilderness characteristics within the 1-mile study corridor of Variations S5-B1 and Variation S5-B2.

Malheur S Alternative

Table 3-394 summarizes information on the units of inventoried wilderness characteristics located in the 1-mile-wide study corridor of the Malheur S Alternative.

Table 3-394. Lands with Wilderness Characteristics Units in the Study Corridor for the Malheur S Alternative in Segment 5—Malheur

Unit Identification/Name	Approximate Unit Size	Meets Criteria for Lands with Wilderness Characteristics	Sufficient Size	Naturalness	Solitude	Primitive and Unconfined Recreation	Supplemental Values	Crossed by Alternative Route Centerline
Broken Rim	26,179	Yes	Yes	Yes	Yes	No	Yes	No
Sourdough Mountain	15,867	Yes	Yes	Yes	Yes	No	Yes	No
Double Mountain	28,181	Yes	Yes	Yes	Yes	No	Yes	No

Table Source: BLM 2009a, 2009b, 2009c

Broken Rim Unit

Broken Rim Unit (OR-0340-027) is approximately 26,179 acres and is bounded by roads on all sides. The Broken Rim Unit was found to possess wilderness characteristics and meets minimum size and naturalness criteria, as well as provides outstanding opportunities for solitude. Recreation opportunities are not considered to be outstanding in quality. Recreation activities include hiking, horseback riding, photography, general sightseeing, and hunting of common game species (deer, chukar, and antelope). Terrain in the northern portion of the unit consists of rough, sharply eroded slopes and a central ridgeline. The central area of the unit comprises rolling lands surrounded by relatively flat area. The east boundary is at the bottom of the ridge in an area known as Sand Hollow. Elevations range

from 2,480 to 5,100 feet and vegetation consists of sagebrush and both native and non-native grasses. The Broken Rim Unit does contain five Greater Sage-Grouse leks and three sites of Biddle's lupine (a BLM special status plant species). Kane Springs harbors the Owyhee Hot Springs snail, a BLM special status animal species, with a strategic classification with the Interagency Special Status Sensitive Species Program.

Citizen Proposed Study Area Associated with Broken Rim Unit

In February 2004, the Vale District received from the ONDA an evaluation of wilderness characteristics for the 92,556-acre Freezeout Ridge (ONDA's name for this area associated with the Broken Rim Unit). Because the BLM documents human developments, man-made features, and motorized primitive trails within the unit, the BLM unit boundary features differ from the ONDA boundary features. The BLM inventory also differs from the ONDA evaluation regarding the opportunity for outstanding recreation activities and confirmed presence of certain wildlife species. Inventory sheets documenting these findings are available on the BLM website: http://www.blm.gov/or/districts/vale/plans/files/BrokenRim_OR-034-027_ALL.pdf.

Sourdough Mountain Unit

The Sourdough Mountain Unit (OR-034-030) is approximately 15,867 acres and is bounded by the PP&L Electric 500-kV transmission line on the south, private land and a road on the east, private land and a road on the west, and private land and a road on the north. The Sourdough Mountain Unit meets minimum size and naturalness criteria, as well as provides outstanding opportunities for solitude. The dispersed recreational opportunities are not considered outstanding in quality. Terrain consists of broad, gradually sloped upper features of Sourdough Mountain and incised drainages. Elevations range from 4,747 to 3,220 feet along the unit's east and the prominent Negro Rock igneous spire is in the unit's northeast corner. Vegetation consists of typical native high desert shrub and both native and non-native grass species. Two separate small sites of Biddle's lupine, a BLM special status plant species, are located adjacent to two of the unit's boundary roads.

Citizen Proposed Study Area Associated with Sourdough Mountain Unit

In February 2004, the Vale District received from the ONDA an evaluation of wilderness characteristics for the 92,556-acre Freezeout Ridge Proposed inventory unit. Because the BLM documents human developments, man-made features, and motorized primitive trails within the unit, the BLM unit boundary features differ from the ONDA boundary features. The BLM inventory also differs from the ONDA inventory regarding the opportunity for outstanding recreation activities and confirmed presence of certain wildlife species. Inventory sheets documenting these findings are available on the BLM website: http://www.blm.gov/or/districts/vale/plans/files/SourdoughMtn_OR-034-030_ALL.pdf.

Double Mountain Unit

The affected environment for the Double Mountain Unit would be the same as the affected environment discussed for the Applicant's Proposed Action Alternative.

Malheur A Alternative

Table 3-395 summarizes information on the units of inventoried wilderness characteristics within the 1-mile-wide study corridor of the Malheur A Alternative.

Table 3-395. Lands with Wilderness Characteristics Units in the Study Corridor for the Malheur A Alternative in Segment 5—Malheur

Unit Identification/Name	Approximate Unit Size	Meets Criteria for Lands with Wilderness Characteristics	Sufficient Size	Naturalness	Solitude	Primitive and Unconfined Recreation	Supplemental Values	Crossed by Alternative Route Centerline
Board Corral Mountain	15,463	Yes	Yes	Yes	Yes	No	Yes	No
Sand Hollow	12,272	Yes	Yes	Yes	Yes	No	Yes	No
Burnt Mountain	8,105	Yes	Yes	Yes	Yes	No	Yes	No
Broken Rim	26,179	Yes	Yes	Yes	Yes	No	Yes	No
Sourdough Mountain	15,867	Yes	Yes	Yes	Yes	No	Yes	No
Double Mountain	28,181	Yes	Yes	Yes	Yes	No	Yes	Yes

Table Source: BLM 2008, 2009a, 2009b, 2009c, 2009d, 2010

Board Corral Mountain

Board Corral Mountain (OR-034-016) is approximately 15,463 acres and is bounded by roads on all sides. In addition, portions of the unit's west and southwest boundary road share a common road boundary with the Wild Horse Basin inventory unit (OR-3-77B) and Honeycombs inventory unit (OR-3-77A), respectively. The Board Corral Mountain Unit meets minimum size and naturalness criteria, as well as provides outstanding opportunities for solitude. However, opportunities for primitive or unconfined are not considered to be outstanding. The unit's terrain consists of a series of draws and drainages stemming from the north-south Owyhee Ridge and rolling terrain with rock outcrops. Elevations range from 2,680 to 4,975 feet and dominant vegetation consists of sagebrush community with native and non-native rangeland grasses. Recreation activities that occur within the area include hiking, horseback riding, wildlife viewing, photography, and general sightseeing.

Citizen Proposed Study Area Associated with Board Corral Mountain

In February 2004, the Vale District received from ONDA its evaluation of wilderness characteristics for the 15,503-acre Buck Gulch Proposed inventory unit. The boundaries of the proposed inventory unit are the same as the boundaries of the ONDA's proposal. The BLM inventory differs from the ONDA evaluation in that BLM finds that the unit does not provide outstanding primitive and unconfined recreation opportunities. The BLM and the ONDA both find that supplemental values are present, although the BLM does acknowledge that habitat requirements may exist for Woodhouse's Toad, the Desert Horned Lizard, the Ferruginous Hawk, the Pygmy Rabbit, and the White-tailed Antelope

Squirrel. However, neither the ONDA nor any other entity has provided the BLM official documentation confirming the presence of these species within this inventory unit.

Sand Hollow

The Sand Hollow Unit (OR-034-023) is approximately 12,272 acres and is bounded by a road, the wide PP&L 500-kV transmission line corridor right-of-way, and a private land parcel in its easternmost location. The Sand Hollow Unit meets minimum size and naturalness criteria, as well as provides outstanding opportunities for solitude. However, opportunities for primitive and unconfined recreation are not considered to be outstanding. Terrain consists of the upper slopes of Grassy Mountain, a complex of steep, rugged draws and drainages with elevations ranging from 2,460 to 4,520 feet. Vegetation consists predominately of sagebrush and various native and non-native grass species. Recreation activities that occur within the unit include hunting of common upland and big game species (deer, chukar, and antelope), general hiking, horseback riding and photography. The unit does have supplemental values related to paleontological resources, presence of Cusick's pincushion (BLM sensitive species), and presence of bighorn sheep habitat.

Citizen Proposed Study Area Associated with Sand Hollow

In February 2004, the Vale District received from ONDA its evaluation of wilderness characteristics for the 13,665-acre Grassy Mountain proposed inventory unit. The BLM inventory does not find opportunity for primitive and unconfined recreation. The BLM inventory differs in findings related to Greater Sage-Grouse leks within this unit. In addition, the BLM acknowledges that habitat requirements may exist for the Ground Snake, Ferruginous Hawk, Pygmy Rabbit, and White-tailed Antelope Squirrel; however, neither the ONDA nor any other entity has provided the BLM with official documentation confirming the presence of these species within this inventory unit. The BLM has documented the occurrence of the Mojave Black-collard Lizard and Desert Horned Lizard within this proposed unit. Inventory sheets documenting these findings are available on the BLM website at: http://www.blm.gov/or/districts/vale/plans/files/SandHollow_OR-034-023_ALL.pdf.

Burnt Mountain

The Burnt Mountain Unit (OR-034-024) is approximately 8,105 acres and is bounded by a road and Oxbow Basin and shares an administrative boundary with lands managed by Reclamation at Owyhee Reservoir. The Burnt Mountain Unit meets minimum size and naturalness criteria, as well as provides outstanding opportunities for solitude. However, opportunities for primitive and unconfined recreation are not considered to be outstanding. Supplemental values for the unit include habitat range for California bighorn sheep. Terrain consists of ridges, hills, eroded rims, and plateaus. Elevations within the unit range from 3,014 to 3,816 feet and vegetation consists of desert sage dominated by cheat grass and bunchgrasses. Recreation activities that occur within this unit include hiking, rock collecting, hunting, photography, and sightseeing.

Double Mountain Unit

The affected environment for the Double Mountain Unit would be the same as the affected environment discussed for the Applicant's Proposed Action Alternative.

SEGMENT 6—TREASURE VALLEY

There are no lands with wilderness characteristics units within the study corridor in Segment 6.

3.2.10.6 ENVIRONMENTAL CONSEQUENCES (RESULTS OF ANALYSIS)

TYPES OF POTENTIAL EFFECTS

In general, when evaluating actions with potential effects on lands with wilderness characteristics, the BLM must consider the quality of wilderness characteristics and determine whether the action would result in:

- Reduction of naturalness to the point that all or a portion of an area found to possess wilderness characteristics would no longer meet this criterion
- Reduction of identified opportunities for solitude or primitive and unconfined recreation to the point that they would no longer be outstanding
- Degradation of unique, supplemental, or other features identified for the unit

Potential effects on wilderness characteristics could result from construction, operation, and maintenance activities. More specifically, the introduction of roads or developed rights-of-way could subdivide units with wilderness characteristics and either (1) reduce size and naturalness or diminish opportunity for solitude or primitive and unconfined recreation or (2) bisect, and thereby remove, a portion of the continuous unit so that the unit no longer meets the 5,000-acre size requirement.

Short-term direct effects on apparent naturalness, solitude, and primitive and unconfined recreation of the area would be related to the sights and sounds of construction activities, including noise, dust, and vehicle emissions from construction activities and equipment, as well as potential access restrictions to the unit during construction for public health and safety.

Long-term direct impacts on apparent naturalness could be associated with presence of access roads and tower structures, right-of-way clearing and maintenance, and overstory vegetation removal that could diminish the recreational and wilderness experience for visitors. Outstanding opportunities for solitude or primitive and unconfined recreation also would be diminished.

Indirect effects on wilderness characteristics could occur if temporary or permanent access routes resulted in increased access to lands with wilderness characteristics, resulting in public uses that are incompatible with the wilderness resources (e.g., diminishment of opportunities for solitude).

In addition, potential impacts on lands with wilderness characteristics units that have not yet been through the BLM planning process could include future limitations of management related to wilderness characteristics. For lands within the Vale District (Malheur Field Office), any B2H Project activities that would affect lands with wilderness characteristics could not be implemented before the SEORMP amendment is finalized and a decision regarding wilderness characteristics of the subject lands is made.

NO ACTION ALTERNATIVE

Under the No Action Alternative, a right-of-way grant for the B2H Project would not be granted. The B2H Project would not be developed and the environment would remain as it presently exists.

EFFECTS COMMON TO ALL ACTION ALTERNATIVES

None of the alternatives or route variations in Segments 1, 2, 3, 4, and 6 cross lands with wilderness characteristics units that have been designated as a natural area or prescribed for protection of wilderness characteristics under a BLM land-use plan. Therefore, no effects on the management and protection prescriptions for the protection of wilderness characteristics are anticipated from implementation of the B2H Project. As previously mentioned, any proposed action on lands with wilderness characteristics within the Vale District could not be implemented before the SEORMP amendment is finalized and a decision regarding wilderness characteristics of the subject lands is made.

Potential impacts on lands with wilderness characteristics from geotechnical investigation activities would be largely avoided through implementation of design features of the B2H Project for environmental protection (refer to Table 2-7) and selective mitigation measures. Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on lands with wilderness characteristics would be minor to negligible. Geotechnical testing would be coordinated with the local BLM field office. Overland travel in lands with wilderness characteristics would be avoided unless approved by the local BLM field office. Segment 1—Morrow-Umatilla

There are no lands with wilderness characteristic units within Segment 1. Thus, no identifiable impacts on lands with wilderness characteristics would result from implementation of the B2H Project in Segment 1.

SEGMENT 2—BLUE MOUNTAINS

There are no lands with wilderness characteristics units within Segment 2. Thus, no identifiable impacts on lands with wilderness characteristics would result from implementation of the B2H Project in Segment 2.

SEGMENT 3—BAKER VALLEY

There are no lands with wilderness characteristics units within Segment 3. Thus, no identifiable impacts on lands with wilderness characteristics would result from implementation of the B2H Project in Segment 3.

SEGMENT 4—BROGAN AREA

There are no lands with wilderness characteristics units within Segment 4. Thus, no identifiable impacts on lands with wilderness characteristics would result from implementation of the B2H Project in Segment 4.

SEGMENT 5—MALHEUR AREA

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative does not cross any lands with wilderness characteristics units. Therefore, no identifiable impacts are anticipated on lands with wilderness characteristics from the Applicant's Proposed Action Alternative.

Variation S5-A1

Variation S5-A1 was developed to avoid lands with wilderness characteristics (Link 5-15). The 250 foot right-of-way for Variation S5-A1 does not cross any lands with wilderness characteristics units. Therefore, no identifiable impacts on lands with wilderness characteristics would be anticipated if this route were selected.

Variation S5-A2

Variation S5-A2 crosses the northern portion of the Double Mountain Unit about at Link 5-20 about 2 miles south of the northernmost boundary (parcel of private land). Variation S5-A2 would create a new unit boundary and remove 1,890 acres from the contiguous unit. The removal of this portion of the unit would not reduce the area below the 5,000-acre size requirement for consideration for wilderness designation. The remaining Double Mountain Unit would be 26,290. Within the Double Mountain units, all roads and impacts would be required to stay in the B2H Project right-of-way boundary. The B2H Project right-of-way would become the new wilderness characteristics unit boundary on the north end of the unit.

B2H Project short-term effects on opportunities for solitude and unconfined/primitive recreation of the area along the north edge of the unit would be visual effects, noise, dust, and vehicle emissions from construction activities and equipment, as well as potential restrictions on access to inventoried areas. Long-term effects from the B2H Project would be the influences of the B2H Project infrastructure, including the vertical prominence of transmission structures.

As mentioned previously, the BLM Vale District is under a court-approved settlement agreement that sets out certain requirements that the BLM must follow until the BLM completes an RMP amendment for the SEORMP. In particular, the settlement agreement precludes the BLM from approving any surface-disturbing activity on lands that the BLM has identified as having wilderness characteristics if the BLM finds that a project or action would either diminish the size of the inventory unit or cause the entire inventory unit to no longer meet the criteria for wilderness character. Therefore, Variation S5-A2 could not be implemented per the 2010 court-approved settlement agreement.

Variation S5-B1

Variation S5-B1 would have no identifiable impacts on lands with wilderness characteristics.

Variation S5-B2

Variation S5-B2 would have no identifiable impacts on lands with wilderness characteristics.

Malheur S Alternative

The Malheur S Alternative was developed to avoid lands with wilderness characteristics (Link 5-25). The 250 foot right-of-way for the Malheur S Alternative does not cross any lands with wilderness characteristics units. Therefore, no identifiable impacts are anticipated to lands with wilderness characteristics from the Malheur S Alternative.

Malheur A Alternative

The Malheur A Alternative does not cross any lands with wilderness characteristics units. Therefore, no identifiable impacts are anticipated on lands with wilderness characteristics from the Malheur A Alternative.

Conclusions

Variation S5-A2 is the only route that crosses lands with wilderness characteristics and would therefore be precluded from implementation as per the 2010 court-approved settlement agreement. There is no discernable difference of impacts among other alternatives within Segment 5. Variation S5-A2 would create a new unit boundary and remove 1,890 acres from the contiguous unit. However, the removal of this portion of the unit would not reduce the area below the 5,000-acre size requirement for consideration for wilderness designation.

SEGMENT 6—TREASURE VALLEY

There are no lands with wilderness characteristics units within Segment 6. Therefore, no identifiable impacts on lands with wilderness characteristics would result from implementation of the B2H Project in Segment 6.

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3.2.11 POTENTIAL CONGRESSIONAL DESIGNATIONS

3.2.11.1 INTRODUCTION

Congressional designations are lands managed by federal agencies to protect values and land uses unique to an area. These areas require more intensive management emphasis than is applied to surrounding public lands because these areas are designated by an act of Congress. Congressionally designated areas relevant to the B2H Project area include NHTs. Trails under study or recommended as suitable for congressional designation are also potential congressional designations and are discussed in the National Historic Trails section (Section 3.2.15)."

A potential congressional designation discussed in this section, the Owyhee River Below the Dam suitable Wild and Scenic River (WSR) segment, is a river segment suitable for inclusion in the WSR system.

There are no wilderness areas, WSAs, or inventoried roadless areas in the study corridor for any of the alternative routes and route variations.

3.2.11.2 REGULATORY FRAMEWORK

FEDERAL

Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act of 1968 (Public Law 90-542, as amended) established a method for providing federal protection for certain of our country's remaining free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations. Rivers are included in the National Wild and Scenic Rivers System (National System) so that they may benefit from the protective management and control of development for which the act provides. To be eligible for inclusion in the National System, a river must be free-flowing and the stream corridor must contain at least one outstandingly remarkable resource value, such as its scenic, wildlife, or recreational value.

Section 5(d)(1) of the Wild and Scenic Rivers Act requires federal agencies to consider and evaluate rivers under their management for potential designation as WSRs, while preparing their broader land-use plans. This evaluation is a three-step process: eligibility, classification, and suitability. Based on eligible rivers' level of development and level of accessibility, the rivers are tentatively classified as wild, scenic, or recreational rivers. Once deemed an eligible river, the river is then evaluated further for suitability. Suitability analyses review the jurisdictional and management constraints, among other issues, within a land-use planning process. Rivers designated into the National System are administered so as to protect and enhances the river's values and preserve the river and its immediate environment for the use and enjoyment of present and future generations (BLM 2012a).

The Omnibus Act of 2009

The Omnibus Public Land Management Act of 2009 (16 U.S.C. 7202) (the Omnibus Act of 2009 or Act) established the National Landscape Conservation System (NLCS), which was established administratively by Secretarial Order in 2000 "in order to conserve, protect, and restore nationally

significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations." The NLCS includes these areas administered by the BLM; national monuments, National Conservation Areas, wilderness areas, WSAs, WSRs, national scenic and historic trails, cooperative management and protection areas, outstanding natural areas, and forest reserves.

Bureau of Land Management Manual 6100 – National Landscape Conservation System Management Manual (Public)

This manual provides the general policy for BLM personnel on how to manage public lands in the NLCS. In general, the BLM's objective is to protect, conserve, and restore the values the NLCS units were designated for; manage valid existing rights and compatible uses in NLCS units; use science, local knowledge, partnerships, and volunteers to effectively manage NLCS units; provide recreational, educational, interpretation, and visitor services; and use and showcase innovative techniques to manage compatible multiple uses in NLCS units (BLM 2012b).

Bureau of Land Management Manual 6400 – Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management (Public)

This manual provides the "policy and program direction for the identification, evaluation, and management of eligible and suitable WSRs and the management of designated components of the National Wild and Scenic Rivers System (National System). In addition, this policy allows for BLM to authorize a project within an eligible or suitable river corridor, if the project does not alter the free flowing condition and if the outstandingly remarkable values remain protected. The policies and program guidance for WSR in this manual are consistent with NLCS's mission to conserve, protect, and restore nationally significant landscapes recognized for outstanding cultural, ecological, and scientific values". "BLM's policy goal for suitable rivers is to manage their free-flowing condition, water quality, tentative classification, and outstandingly remarkable values until Congress designates the river or releases it for other purposes. To that end, BLM has broad discretionary authority, on a case-by-case basis through project-level decision-making and the NEPA process, not to impact river values or make decisions that might lead to a determination of nonsuitability" (BLM 2012a).

3.2.11.3 Issues Identified for Analysis

The issues identified during scoping and review of the Draft EIS by both the public and agencies in relation to congressional designations and potential congressional designations (i.e., wilderness areas, WSAs, and potential WSR segments) include the following:

- What would be the effects on the wilderness character of wilderness areas and WSAs?
- What effects will the B2H Project have on suitable WSRs?

3.2.11.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.3 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on potential congressional designations.

DATA SOURCES

The analysis in this section is based on the BLM assessment report (BLM 1998) for the suitable WSR segment in the study corridor.

ANALYSIS AREA

The analysis area for identifying potential congressional designations is a 1-mile-wide study corridor (i.e., 0.5 mile on either side of the reference centerline for the alternatives and route variations.) The study corridor also includes sites for substations, communication sites, multi-use areas, and fly yards.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria for determining the level of impacts were not developed specifically for suitable WSR segments to assess impacts. Rather, the impact criteria developed for biological resources (including vegetation resources, wildlife and fish, geologic resources, scenic, and recreation resources) were used to assess the level of impacts on the potential classification and outstandingly remarkable values of the suitable WSR segment (refer to Sections 3.2.3, 3.2.4, 3.2.5, 3.2.8, and 3.2.12). The effects from the B2H Project to the scenic outstandingly remarkable value are discussed below in Sections 3.2.11.5 and 3.2.11.6.

Effects Analysis

The effects analysis for the suitable WSR segments varies from the analysis of other resources within this EIS because the high, moderate, and low criteria were not used to assess level of impacts. Instead, the number of miles that the alternative routes and route variations cross a suitable WSR segment is presented, followed by a qualitative discussion of how this crossing may affect the management prescriptions and the values of the segment. The analysis also discloses potential impacts on an agency's ability to manage the suitable WSR segment according to the agency's current respective management plans. For specific information regarding the impacts on resources located within a suitable WSR segment crossed by an alternative route or route variation, refer to the applicable resource section (e.g., biological resources, recreation, etc.).

Mitigation Planning and Effectiveness

In addition to the design features of the B2H Project for environmental protection that are part of the B2H Project description (Table 2-7), selective mitigation measures were developed to minimize adverse impacts on potential congressional designations (Table 2-13). Selective mitigation measures were applied to avoid or minimize effects on resources being protected by the potential congressional

designation (e.g., biological resources, recreation, etc.) instead of by the potential congressional designation boundary.

The BLM would require compensatory mitigation to offset impacts on the outstandingly remarkable values and tentative classification of the Owyhee River Below the Dam suitable WSR segment where impacts cannot be avoided effectively, in accordance with the Department of the Interior's Secretarial Order 3330 and the BLM's Draft Regional Mitigation Manual (Draft Manual Section 1794 "Regional Mitigation Manual" [BLM 2014] and consistent with the CEQ's NEPA regulations, 40 CFR 1508.20). Secretarial Order 3330 provides a policy that directs the Department of the Interior to "seek ways to offset or compensate for those impacts [that cannot be avoided or effectively minimized] to ensure the continued resilience and viability of our natural resources over time." BLM Draft Manual Section 1794 also reflects the BLM's policy (interim) commitment to "consider mitigation outside of the area of impact when it is not feasible or practical to mitigate impacts to an acceptable level in the same area as the use-authorization" (BLM 2014).

Appendix C of this EIS contains a Mitigation Framework. The Mitigation Framework (1) establishes how avoidance and minimization have eliminated and/or reduced impacts; (2) identifies unavoidable remaining resource effects that meet criteria for warranting compensatory mitigation; (3) provides a framework for how the appropriate level and type of compensatory mitigation will be determined for those resource effects; and (4) identifies the types of compensatory mitigation measures or projects that could be applied in specific areas to offset the unavoidable remaining impacts.

Upon selection of the final route in the ROD and following final engineering and design, the compensatory mitigation plan will update, as needed, the direct and indirect impacts based on an engineered and designed alignment, and will identify a suite of site-specific compensatory mitigation options for selection and implementation under the review and guidance of the cooperating agencies. The final detailed compensatory mitigation plan must be reviewed by the cooperating agencies and a recommendation will be made to the Authorized Officer for approval prior to any issuance of Notices to Proceed.

Additional Analysis

No additional analysis was completed for this resource.

3.2.11.5 Affected Environment

Segment 1—Morrow-Umatilla

There are no potential congressional designations in the study corridor for Segment 1.

Segment 2—Blue Mountains

There are no potential congressional designations in the study corridor for Segment 2.

Segment 3—Baker Valley

There are no potential congressional designations in the study corridor for Segment 3.

SEGMENT 4—BROGAN AREA

There are no potential congressional designations in the study corridor for Segment 4.

SEGMENT 5—MALHEUR AREA

Table 3-396 and MV-21 present the resource inventory of potential congressional designations in the study corridor for the alternatives and route variations in Segment 5.

Table 3-396. Alternative Owyhee River Below the Dam Suitable Wild and Scenic River Segment in Segment 5—Malheur Area

Alternative Route	Total Length (miles)	Potential Congressional Designations (miles)[1]
Applicant's Proposed Action	40.4	0.9
Variation S5-A1	*7.4*	*0.0*
Variation S5-A2	*7.4*	*0.0*
Variation S5-B1	*2.5*	*0.9*
Variation S5-B2	*2.8*	*0.0*
Malheur S	43.5	1.1
Malheur A	43.1	1.1

Table Note: [1]The Potential Congressional Designations crossed by the reference centerline or right-of-way, or both.

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative crosses the Owyhee River Below the Dam suitable WSR segment in the BLM Malheur field office for less than 1 mile (refer Table 3-396). This river is 13.5 miles long (4.3 miles are managed by Reclamation) and has the proposed classification of recreational with outstanding remarkable recreation, scenic, geologic, fish, wildlife, and botanic values. The Owyhee River Below the Dam SRMA (refer to Section 3.2.8,) and Owyhee River Below the Dam ACEC (refer to Section 3.2.6) also are managed in this same segment of the Owyhee River. This area receives the highest recreational use in the BLM Malheur resource planning area (BLM 2002).

Based on the Eligibility Assessment for River Segments Identified for Possible Inclusion as Components of the National Wild and Scenic Rivers System, the following is a summary of the outstandingly remarkable values (ORVs) for the suitable WSR:

- Recreation: "All BLM administered public land within the visual corridor of the inventory river are part of the BLM designated Lower Owyhee River Watchable Wildlife Area. The area is noted for its diversity in bird life, with opportunities, also, to enjoy wildlife viewing of various mammals and some reptiles." There is an interpretative site, recreation site, and campgrounds. The river corridor also offers opportunities for upland bird and big game (deer) hunting, seasonal fishing, and dispersed recreation activities (e.g., camping, hiking, and general sightseeing).
- Scenic: Described as "deep and largely restricted canyon corridor with a highly diverse landscape, high vertical to near vertical walls and extensive rimrock, massive rock outcrops from very steep and highly colorful side slopes, rock windows and arched of significant size, and the confluences of several side canyons, each of highly diverse landscape character. Regarding

natural features, there exists a visual continuity with the designated wild river segment, broken only by the 53-mile long reservoir created by the Owyhee River dam."

- Geologic: Areas with the best opportunities in southeast Oregon to study geologic evolution of a major canyon, including volcanism, sedimentation, chemical alteration, tectonics (i.e., folding and faulting), and subsequent erosion, combined to create this deep, steep-walled, winding canyon.
- Fish: The river has a catch and release fishery for trophy brown trout (which is an exotic species) because the river provides good habitat.
- Wildlife: Several wildlife species use the river corridor because of the diverse habitats. Wildlife species that use the corridor include mule deer; chukar; California quail; various waterfowl; owls, prairie falcons, golden eagles, and other raptors; neotropical migratory birds; coyote; and beaver and other small mammals. Migratory bird counts also occur in the Watchable Wildlife area.
- Botanic: Extensive populations of Mulford's milk-vetch (a federal Category 1 species) and Bigelow's four-o'clock (a BLM listed sensitive species) exist in the area.

The river segment is readily accessible by a two-lane county road that parallels portions of the Owyhee River, has some recreational development along the shoreline, and has an impoundment or diversion where the Applicant's Proposed Action Alternative crosses the river. There are two boat put-ins located in the vicinity of the Applicant's Proposed Action Alternative: one approximately 0.5 mile to the north and another approximately 0.4 mile to the south. In the SEORMP (BLM 2002), this area is considered an avoidance area for utility rights-of-way. New rights-of-way may be granted if there is minimal conflict with the identified resource values and impacts can be mitigated. The Applicant's Proposed Action Alternative is in the corridor except where there is a land jurisdiction change that is on either side of the river. The Applicant's Proposed Action Alternative then would be located outside of the BLM utility corridor.

Variations S5-A1 and S5-A2

These route variations avoid the Owyhee River Below the Dam suitable WSR segment.

Variation S5-B1

This route variation crosses the Owyhee River Below the Dam suitable WSR segment. The conditions of the existing environment are the same as the conditions for the Applicant's Proposed Action Alternative.

Variation S5-B2

This route variation avoids the Owyhee River Below the Dam suitable WSR segment, with the reference centerline passing just north of the suitable segment. However, the right-of-way for the variation would just cross into the suitable WSR for approximately 80 feet (refer to MV-21).

Malheur S Alternative

The Malheur S Alternative crosses the Owyhee River Below the Dam suitable WSR segment farther south than the Applicant's Proposed Action Alternative and north of the Lake Owyhee Reservoir for 1.1 miles. Similar to the Applicant's Proposed Action Alternative, the alignment follows the existing county road and development along the southern side of the Owyhee River. However, the Malheur S Alternative is not located in the designated BLM utility corridor.

Malheur A Alternative

Similar to the Malheur S Alternative, the Malheur A Alternative crosses the Owyhee River Below the Dam suitable WSR segment farther south than the Applicant's Proposed Action Alternative and north of the Lake Owyhee Reservoir for 1.1 miles. The Malheur A Alternative follows an existing county road on the east side of the Owyhee River, and there is development north of where this alternative route crosses. This alternative uses a BLM utility corridor and a West-Wide Energy Corridor (in different areas) that are designated for all utility types. The route is located adjacent to an existing 500-kV transmission line in the West-Wide Energy Corridor.

SEGMENT 6—TREASURE VALLEY

There are no potential congressional designations in the study corridor for Segment 6.

3.2.11.6 ENVIRONMENTAL CONSEQUENCES (RESULTS OF ANALYSIS)

TYPES OF POTENTIAL EFFECTS

The construction, operation, and maintenance of the B2H Project could result in both direct and indirect effects on potential congressional designations. Potential direct effects associated with construction, operation, and maintenance activities could include the following:

- Construction activities could conflict with management prescriptions of a potential congressionally designated area (short-term effect)
- Presence of the transmission and ancillary facility could conflict with management prescriptions for a potential congressional designation (short-term effect)
- Free-flowing condition of the suitable WSR segment could be altered by the construction or presence of the B2H Project (short- and long-term effect)
- The ORVs identified for the suitable WSR segment could be affected (long-term effect)
- Vegetation management of the transmission line corridor could conflict with the management prescriptions for the potential congressional designation (short- and long-term effect)

Indirect effects could include restricted access to a potential congressionally designated area as a result of construction activities (short-term).

NO ACTION ALTERNATIVE

Under the No Action Alternative, a right-of-way grant for the B2H Project would not be granted. The B2H Project would not be developed and the environment would remain as it presently exists.

EFFECTS COMMON TO ALL ALTERNATIVES

Potential impacts on lands with congressional designations from geotechnical investigation activities would be largely avoided through implementation of design features of the B2H Project for environmental protection (refer to Table 2-7) and selective mitigation measures. Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on lands with congressional designations would be minor to negligible. Geotechnical testing would be coordinated with the local BLM field office. Overland travel in lands with wilderness characteristics would be avoided unless approved by the local BLM field office.

SEGMENT 1—MORROW-UMATILLA

There are no lands with congressional designations crossed by the Applicant's Proposed Action Alternative and other alternatives and route variations. Thus, no effects on potential congressional designations would result from implementation of the B2H Project in Segment 1.

SEGMENT 2—BLUE MOUNTAINS

There are no lands with congressional designations crossed by the Applicant's Proposed Action Alternative and other alternatives and route variations. Thus, no effects on potential congressional designations would result from implementation of the B2H Project in Segment 2.

SEGMENT 3—BAKER VALLEY

There are no lands with congressional designations crossed by the Applicant's Proposed Action Alternative and other alternatives and route variations. Thus, no effects on potential congressional designations would result from implementation of the B2H Project in Segment 3.

SEGMENT 4—BROGAN AREA

There are no lands with congressional designations crossed by the Applicant's Proposed Action Alternative and other alternatives and route variations. Thus, no effects on potential congressional designations would result from implementation of the B2H Project in Segment 4.

SEGMENT 5 - MALHEUR AREA

Table 3-397 presents the residual impacts on all alternative routes and route variations in Segment 5.

Table 3-397. Alternative Route Comparison for Segment 5—Malheur Area

Alternative Route	Total Length (miles)	Miles of Resource Crossed by Alternative Route
Applicant's Proposed Action	*40.4*	*0.9*
Variation S5-A1	*7.4*	*0.0*
Variation S5-A2	*7.4*	*0.0*
Variation S5-B1	*2.5*	*0.9*
Variation S5-B2	*2.8*	*0.0*
Malheur S	43.5	1.1
Malheur A	43.1	1.1

Applicant's Proposed Action Alternative

Management direction in the SEORMP (BLM 2002) provides interim protection of ORVs of rivers found suitable for inclusion in the National WSR System until Congress acts. The Applicant's Proposed Action Alternative crosses the Owyhee River Below the Dam suitable WSR segment (Link 5-55) for 0.9 mile adjacent to, but outside of, a utility corridor designated in the SEORMP. Owyhee River Below the Dam suitable WSR segment is an avoidance area for utility rights-of-way. Therefore, the Applicant's Proposed Action Alternative would be consistent with the management identified in the SEORMP if there is minimal conflict with the identified resource values and impacts can be mitigated.

Short-term effects from implementation of the B2H Project would include increased noise and dust and increased activity along both sides of the river, which would temporarily disturb recreation users and possibly affect recreational access to the river during the construction phase.

No long-term effects on access to and availability of recreational opportunities (i.e., fishing and canoeing) would be expected.

The Applicant's Proposed Action Alternative would affect the view and experience of recreation users along the river and within the area with recreation designation. The construction of the B2H Project south of the BLM RMP utility corridor, near the mouth of the canyon, would dominate views in the enclosed landscape setting associated with the Owyhee River through the introduction of skylined transmission line structures from an inferior viewing position. An existing siphon has modified the existing setting, located 0.25 mile west of where the B2H Project crosses the river, but due to the scale of the proposed transmission line structures, impacts on the recreation experience (from altered scenic conditions) would occur at the eastern edge of the suitable river segment. As recreation users approach the crossing of the Owyhee River, views of skylined structures, construction access routes, and vegetation clearing would become visible and increasingly dominate the river's scenic setting. For a discussion of BLM visual resource management (VRM) objectives associated with this area, refer to Section 3.2.12.

Placement of any B2H Project components across the Owyhee River suitable segment would be micro-sited prior to construction in coordination with the BLM to minimize surface or visual disturbances from towers or other facilities and to minimize impacts on recreation and the visual environment (refer to Section 3.2.12). Other selective mitigation measures that would be applied include minimizing ground disturbance associated with construction and maximizing the span length between transmission line structures at the river crossing to reduce their dominance within Owyhee River's viewshed to the extent that is technically feasible.

The B2H Project would not alter the river's free-flowing condition. Effects on the ORVs described for geologic resources (refer to Section 3.2.1), fish resources (refer to Section 3.2.5), wildlife resources (refer to Section 3.2.4), and vegetation (refer to Section 3.2.3) would be minimal and mitigatable or would not be anticipated.

Variation S5-A1

This route variation does not cross the Owyhee River Below the Dam suitable WSR segment. No effects on potential congressional designations would occur.

Variation S5-A2

This route variation does not cross the Owyhee River Below the Dam suitable WSR segment. No effects on potential congressional designations would occur.

Variation S5-B1

Variation S5-B1 crosses the Below the Dam suitable WSR segment (Link 5-55). The effects would be the same as the effects described for the Applicant's Proposed Action Alternative.

Variation S5-B2

The reference centerline for Variation S5-B2 does not cross the Owyhee River Below the Dam suitable WSR segment, but the right-of-way associated with construction and maintenance of the route variation does for about 80 feet. Short-term effects from implementation of the B2H Project would include increased noise and dust and increased activity along both sides of the river, which would temporarily disturb recreation users and possibly affect recreational access to the river during the construction phase. No long-term effects on access to and availability of recreational opportunities (i.e., fishing and canoeing) would be expected.

In addition to the effects described above, the Variation S5-B2 would affect the view and experience of recreation users along the river and within the area with scenic ORV designation. The construction of the B2H Project in the BLM RMP utility corridor (at the mouth of the canyon outside of the eligible WSR segment) would locally dominate views at the mouth of the canyon. However, views would be screened by topography for most of the eligible WSR segment. Due to the siting of this route variation east of the steep terrain along the Owyhee River, the transmission line structures would be less visible and not dominate views up the canyon. Continuing down river, views are mostly screened by the steep canyon walls. For a discussion of BLM VRM objectives associated with this area, refer to Section 3.2.12.

Placement of any B2H Project components across the Owyhee River would be micro-sited prior to construction in coordination with the BLM to minimize surface or visual disturbances from towers or other facilities and to minimize impacts on the visual environment (refer to Section 3.2.12). Other selective mitigation measures that would be applied include minimizing ground disturbance associated with construction and maximizing the span length between transmission line structures at the river crossing to reduce their dominance within Owyhee River's viewshed to the extent that is technically feasible.

Malheur S Alternative

The Malheur S Alternative crosses the suitable WSR for 1.1 miles, farther south of the Applicant's Proposed Action Alternative and north of the Lake Owyhee Reservoir (Link 5-30). The Malheur S Alternative does not cross the suitable WSR within a BLM utility corridor and instead is located in a utility avoidance area, per the SEORMP (BLM 2002). Short-term effects from the alternative route

crossing the suitable WSR could include increased noise and dust during construction and maintenance activities and increased activity along both sides of the river, which would temporarily disturb recreation users and possibly affect recreational access to the river during the construction phase. No long-term effects on access to and availability of recreational opportunities (i.e., fishing and canoeing) would be expected. Similar to the Applicant's Proposed Action Alternative, the Malheur S Alternative would affect the view and experience of recreation users along the river within the area with scenic ORV designation but not hinder recreational opportunities (i.e., rafting or canoeing). As the river turns to the east, views would become increasingly dominated by the Malheur S Alternative through the presence of skylined structures, construction access routes, and vegetation clearing. For a discussion of BLM VRM objectives associated with this area, refer to Section 3.2.12.

Placement of any B2H Project components across the Owyhee River suitable segment would be micro-sited prior to construction in coordination with the BLM to minimize surface or visual disturbances from towers or other facilities and to minimize effects on the visual environment (refer to Section 3.2.12). Other selective mitigation measures that would be applied include minimizing ground disturbance associated with construction and maximizing the span length between transmission line structures at the river crossing to reduce their dominance within Owyhee River's viewshed to the extent that is technically feasible.

The B2H Project would not alter the river's free-flowing condition. Effects on the ORVs described for geologic resources (Section 3.2.1), fish resources (Section 3.2.5), wildlife resources (Section 3.2.4), and vegetation (Section 3.2.3) would be minimal and mitigatable or would not be anticipated.

Malheur A Alternative

The short- and long-term effects of the Malheur A Alternative would be similar to the effects of the Malheur S Alternative. The Malheur A Alternative crosses the suitable WSR farther south than the Applicant's Proposed Action Alternative and north of the Lake Owyhee Reservoir for 1.1 miles (Link 5-35). Unlike the Malheur S Alternative, the Malheur A Alternative would be located within an SEORMP BLM utility corridor and the West-Wide Energy Corridor, with a portion of the alternative adjacent to an existing 500-kV transmission line. Effects of the Malheur A Alternative on the ORVs would be the similar to the effects of the Malheur S Alternative. No long-term effects on access to and availability of recreational opportunities (i.e., fishing and canoeing) would be expected.

The Malheur A Alternative would affect the view and experience of recreation users along the river and the scenic ORV designation. The construction of the Malheur A Alternative south of the BLM RMP-designated utility corridor and West-Wide Energy Corridor (2 miles downriver of the Owyhee River dam) would dominate views in the enclosed landscape setting associated with the Owyhee River through the introduction of skylined transmission line structures from an inferior viewing position. An existing 500-kV transmission line crosses the river within the designated utility corridors; however, the Malheur A Alternative was sited further to the south to avoid crossing an existing agricultural facility. The Malheur A Alternative would be visible from the Owyhee River dam crossing the Owyhee River. The existing 500-kV transmission line and the Malheur A Alternative would become screened by terrain

diminishing their influence on views for recreation users and the scenic ORV designation. For a discussion of BLM VRM objectives associated with this area, refer to Section 3.2.12.

Placement of any B2H Project components across the Owyhee River suitable segment would be micro-sited prior to construction in coordination with the BLM to minimize surface or visual disturbances from towers or other facilities and to minimize impacts on the visual environment (refer to Section 3.2.12). Other selective mitigation measures that would be applied include minimizing ground disturbance associated with construction and maximizing the span length between transmission line structures at the river crossing to reduce their dominance within Owyhee River's viewshed to the extent that is technically feasible.

Conclusions

All alternative routes analyzed in Segment 5 cross the Owyhee River suitable segment; however, the reference centerline for Variation S5-B2 avoids the Owyhee River suitable segment. A portion of the right-of-way would overlay the boundary of the suitable segment.

Overall, Variation S5-B2 would have the lowest impact on the ORVs for the Owyhee River suitable segment, because of its location at the downstream terminus of the Owyhee River suitable segment where the Owyhee River enters agricultural lands. The Applicant's Proposed Action Alternative is located further within, but still near the downstream terminus of the Owyhee River suitable segment, in an area with increasing road density and other existing developments. The Malheur A Alternative would result in relatively higher impacts on viewers and recreation than the Applicant's Proposed Action Alternative and Variation S5-B2, but the intensity of these impacts would be partially reduced by the context of an existing transmission line and the visibility of the Owyhee River Dam. The Malheur S Alternative would result in the highest impacts on ORVs, particularly scenic and recreational ORVs, because of its location away from other existing infrastructure and development, and its location along a relatively straight river segment with high visibility to recreational viewers.

SEGMENT 6—TREASURE VALLEY

No effects on the potential congressional designations would result from implementation of the B2H Project in Segment 6.

3.2.12 VISUAL RESOURCES

3.2.12.1 INTRODUCTION

The term “visual resources” refers to the composite of basic terrain, geologic and hydrologic features, vegetative patterns, and built features that influence the visual appeal of a landscape. The concept of visual resources also refers to existing viewsheds from sensitive viewing locations or platforms, and includes differing terminology based on the land management agency that the B2H Project would affect. This section of the EIS identifies and describes the existing conditions associated with visual resources located within the B2H Project study corridor and assesses the potential effects or impacts on these resources based on the construction, operation, and maintenance of the B2H Project.

3.2.12.2 REGULATORY FRAMEWORK

The CEQ regulations for implementing NEPA identify aesthetic effects as a type of impact to be addressed in a review under NEPA and state that EISs should include discussion of the design of the built environment (40 CFR 1502.16, 1508.8). The regulations also require discussion of possible conflicts of a proposed action with the objectives of federal, regional, state, local, and tribal land-use plans and policies; federal land-use plans, in particular, typically include guidance for management of visual resources. The CEQ regulations do not include more specific direction about aesthetic impact issues to be considered or the means to evaluate aesthetic impacts.

Federal regulations for right-of-way grants under the FLPMA (43 CFR 2800) focus on administrative and procedural aspects of the grants. The BLM must further require compliance with the terms and conditions of the grant to control or prevent damage to “(i) Scenic, aesthetic . . . values…,” per 43 CFR 28 2805.12(i)(3)(i). Regulations pertaining to special-use authorizations on USFS lands primarily address administrative and procedural aspects of the permit process, although guidance on permit terms and conditions includes the requirement that such authorizations must minimize damage to scenic and aesthetic values (36 CFR 251.56). BLM and USFS consideration of visual resource issues associated with special-use authorizations generally is based on the visual resource provisions of standard BLM and USFS policies and procedures for land-use planning and NEPA compliance.

The BLM and the USFS have developed formal systems to inventory and manage visual resources on the lands under their jurisdiction at a planning level scale. These systems also provide the framework to assess visual change in the landscape, and to demonstrate compliance with applicable visual agency management objectives. In contrast, formal directions for managing visual resources on other federally managed lands, as well as private, state, and municipal lands found within the visual resources study corridor have not been established. Visual Resource Management (VRM) approaches for the respective jurisdictions are discussed below.

FEDERAL LANDS

Federal lands within the study corridor primarily include lands managed by the BLM and the USFS, with some acreage under the jurisdiction of the DoD, Reclamation, the USFWS, and BPA. Both the BLM and

USFS provide specific direction regarding management of visual resources for the lands that they manage. This management direction is summarized below. While the DoD, Reclamation, the USFWS, and BPA do not provide specific VRM direction, a brief summary of each also is provided.

BUREAU OF LAND MANAGEMENT

The BLM uses the VRM System to classify and manage visual resources on lands under its jurisdiction. The VRM System involves inventorying scenic values and establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether they conform to the management objectives (BLM 1984). The BLM's VRM System incorporates scenic quality, public sensitivity, and distance zones to identify visual resource inventory (VRI) classes. These classes represent the relative value of the existing visual landscape, as well as the visual resource baseline from which to measure impacts that the B2H Project may have on these values. In its planning process, the BLM weighs visual and competing resource values and designates the VRM Classes, with associated management class objectives for a given area's visual setting. The assignment of one of four VRM Classes (Table 3-398) becomes an important component of the BLM's RMP for the area.

The scenic quality ratings for the study area are provided on MV-22, viewers are illustrated on MV-23, and VRM Classes are depicted on MV-24. Delineations of the segments, alignments, and alternative routes are provided on Map 2-6 in Chapter 2.

Table 3-398. Bureau of Land Management Visual Resource Management Class Objectives

Visual Resource Management Class	Management Objective
I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Table Source: BLM 1986a

The analysis phase of the VRM process involves assessing and disclosing the potential visual impacts from proposed activities (as required by NEPA) and then determining whether such impacts will meet the management objectives established for the area (plan conformance). To analyze and mitigate

potential visual impacts associated with proposed activities, the BLM uses guidelines described in BLM Handbook H-8431-1, Visual Resource Contrast Rating (BLM 1986a). In this process, the degrees of contrast that viewers would see from selected KOPs (Sensitive Viewing Platforms), or places of scenic importance or places where users tend to congregate, are categorized in a range that includes "none," "weak," "moderate," or "strong" contrast—where "strong" indicates that a proposed activity will create contrast that demands attention, will not be overlooked, and is dominant in the landscape. Factors considered when applying the contrast criteria include distance, angle of observation, length of time the project activities are in view, relative size or scale, season of use, light conditions, recovery time, spatial relationships, atmospheric conditions, and motion.

The study corridor overlaps with the geographic boundaries of the BLM Spokane, Prineville, Vale, and Boise Districts. The review of area-specific BLM planning direction for visual resources applies to the Spokane District, the John Day Basin in the Prineville District, the BLM Baker and Malheur Field Offices in the Vale District, and the Owyhee and Cascade Field Offices in the Boise District. The following BLM RMPs have been reviewed for VRM direction on the B2H Project:

- Spokane RMP/ROD (BLM 1987a)
- John Day Basin Proposed RMP and Final EIS (BLM 2012)
- Baker RMP (BLM 1989)
- Southeastern Oregon RMP, includes the Malheur Field Office (BLM 2002)
- Owyhee RMP (BLM 1999)
- Cascade RMP (BLM 1987b)

Management direction for visual resources that is documented within the BLM plans that are applicable to the study corridor is summarized below.

Spokane District

The BLM issued the current Spokane District RMP in 1985 and adopted that plan through a ROD issued in 1987. With respect to visual resources, the RMP indicates that visual resources would continue to be evaluated as a part of activity and project planning. The document does not discuss specific areas with high scenic values and does not indicate where VRM Classes have been assigned to lands within the district (BLM 1985). Similarly, the ROD indicates that recreational activities and visual resources will be evaluated as part of specific activity plans and will be evaluated in relation to land-use allocations made in the RMP and does not indicate where VRM Classes have been designated (BLM 1987a). VRM Class designations within the Spokane District are Not applicable to this Project, because the Project does not cross lands within the Spokane District.

Prineville District, John Day Basin

The final John Day Basin RMP/ROD was published in 2015, and encompasses more than 5 million acres. This plan provides updated management direction to resolve land-use issues or conflicts, including a goal to protect the quality of scenic values. Although the Prineville District does fall within the visual analysis area, the B2H Project does not cross any VRM Classes in this district.

Vale District, Baker Field Office

BLM-administered lands in the Baker Field Office of the Vale District include portions of Umatilla, Union, and Baker counties. The BLM Vale District issued the current RMP for the Baker Field Office in 1989. The RMP provides direction for a wide range of resource topics, including visual resources (BLM 1989). In general, the RMP guidance for visual resources is to emphasize management of visual resources in selected areas of high visitor use or high visual quality, or both. The Grande Ronde and Powder rivers were determined to be suitable through the Omnibus Oregon Wild and Scenic Rivers Act of 1988 and were designated by Congress as part of the Wild and Scenic River System in the late 1980s. River management plans were later developed for each river in 1993 and 1994. The river management plans appended the 1989 Baker RMP, and both include mention of general protection of high scenic values along the rivers. In addition, the RMP states that activities that will result in significant long-term adverse effects will not be permitted in areas of high scenic quality, such as the Burnt River, Powder River, or Snake River canyons (BLM 1989). Activities in other areas of high visual quality might be permitted if the activities do not attract attention or leave long-term visual changes on the land. The RMP assigns nearly 152,000 acres of the Baker Field Office (35 percent of the total acreage) to VRM Class II, in which management activities can be seen but cannot attract attention of a casual observer from any travel route. No areas within the Baker Field Office of the study corridor were designated as VRM Class I. The RMP assigned approximately 17 percent of the total acreage within the Baker Field Office to be managed as VRM Class III and the majority of the field office (48 percent) to be managed as VRM Class IV.

Vale District, Malheur Field Office

BLM-administered lands in Malheur County are administered by the Vale District of the BLM. The Malheur Field Office cover lands in Malheur County. The Malheur Field Office is located in northern Malheur County (lands north of Jordan Valley, Oregon) as well as south of Jordan Valley, Oregon. The BLM Vale District issued the Southeastern Oregon RMP and Final EIS in 2001 to provide management direction for the Malheur and Jordan Field Offices of the Vale District. The B2H Project area includes a considerable portion of the Malheur Field Office.

The Southeastern Oregon RMP (BLM 2001) identifies nine planning issues to be addressed in the planning process, summarizes existing conditions within the planning area, discusses management direction for the respective resources within the plan alternatives that are under consideration, and assesses the resource impacts that would result from the respective alternatives. Areas with special management direction for resource protection purposes are to be managed as VRM Class I or II. Overall, approximately 309,796 acres in the Malheur Field Office (15 percent of the total acreage) are to be managed as VRM Class I and 144,403 acres (7 percent of the total acreage) are to be managed as VRM Class II. The remainder of the field office is to be managed as VRM Class III (199,078 acres) and Class IV (1,365,457 acres) (BLM 2001).

Boise District, Owyhee Field Office

BLM-administered lands in Owyhee County, Idaho, are located at the southeastern end of the B2H Project area, within the Owyhee Field Office of the Boise District. The Owyhee RMP (BLM 1999)

includes separate sections addressing objectives, management actions, and allocations for a range of resources and management considerations. Approximately 71,332 acres (6 percent of the total acreage) are to be managed as VRM Class I, and 242,150 acres (18 percent) are to be managed as VRM Class II. The RMP also allocates 123,000 acres to VRM Class II-IMP; these are WSAs considered to be nonsuitable for wilderness designation that will be managed as VRM Class II unless or until released from wilderness consideration by Congress, in which case they would be managed as VRM Class IV. The majority of the Owyhee Field Office, 738,228 acres (56 percent), is managed as Class IV areas, and the remaining 144,785 acres (11 percent) is managed as Class III.

Boise District, Cascade Field Office

The study corridor includes a relatively small amount of BLM-administered lands located in Idaho along the Snake River. These lands currently are managed by the Four Rivers Field Office of the Boise District. The current RMP applicable to these lands is the RMP for the Cascade Field Office, which the BLM issued in 1987. The BLM initiated development of a new Four Rivers RMP in 2008, and that planning process is still underway.

The Cascade RMP (BLM 1987b) states that objectives for VRM are to protect the scenic values of the public lands and to manage specific lands within the field office under VRM Classes II (81,000 acres), III (383,466 acres), and IV (23,000 acres); no lands are allocated to VRM Class I. The Class II designation applies to a continuous band of lands along the eastern side of Brownlee and Oxbow reservoirs. This classification corresponds to an area designated elsewhere in the plan as the Oxbow-Brownlee SRMA.

U.S. Forest Service

The study corridor overlaps with the geographic boundaries of the Wallowa-Whitman and Umatilla National Forests; however, only the Wallowa-Whitman Forest would be directly crossed by the B2H Project. Although no direct physical impacts would occur within the Umatilla National Forest, the scenic quality of the lands within the Forest could potentially be affected by distant views of the B2H Project, and are therefore included in the analysis from a NEPA analysis perspective only.

The USFS originally implemented the Visual Management System (VMS) in 1974 to inventory, evaluate, and manage lands for visual resource values, as described in Chapter 1 of the National Forest Landscape Management handbook (USFS 1974). In 1995, the VRM guidelines and monitoring techniques evolved into the Scenery Management System (SMS), as described in *Landscape Aesthetics: A Handbook for Scenic Management* (USFS 1995). However, all USFS lands within the study corridor are currently using the VMS.

The VMS combines landscape variety (variety classes), viewer sensitivity, and distance zones to develop visual quality objectives (VQOs). VQOs are assigned to the landscape to describe the degree of acceptable alteration of the natural landscape (Table 3-399). Each VQO indicates this acceptable degree of landscape change by classifying lands into one of five categories: Preservation, Retention, Partial Retention, Modification, or Maximum Modification. Preservation allows for ecological changes only, while Maximum Modification allows for landscape changes that may dominate the natural

landscape character. The VQOs within the study area are illustrated on the Visual Resources: Federal Agency Visual Management Objectives map (MV-24).

Table 3-399. U.S. Forest Service Visual Resource Objectives (Visual Management System)

Objective	Visual Quality Objectives
Preservation	Landscape alterations generally are not allowed in this visual quality objective. The landscape is allowed to evolve naturally.
Retention	This visual quality objective provides for landscape alterations that are not visually evident. Under the VQO of Retention alterations may only repeat form, line, color, and texture that frequently are found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc., should not be evident.
Partial Retention	Landscape alterations remain visually subordinate to the characteristic landscape when managed according to the partial retention visual quality objective. Alterations may repeat form, line, color, or texture common to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, pattern, etc. remain visually subordinate to the characteristic landscape.
Modification	Landscape alterations may visually dominate the original characteristic landscape. However, alterations of vegetative and landform alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that the alteration's visual characteristics are those of natural occurrences within the surrounding area or character type.
Maximum Modification	Landscape alterations may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background. Alterations to vegetation and landforms may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middleground, they may not appear to completely borrow from naturally established form, line, color, or texture.

Table Source: USFS 1995

Wallowa-Whitman National Forest Land and Resource Management Plan

Regarding visual resources, the Wallowa-Whitman National Forest LRMP (USFS 1990a) indicates that "Management of the Forest's visual resources is emphasized within the viewsheds of federal and state highways and major Forest roads. The visible land areas adjacent to selected travel routes are managed for a variety of VQOs including Retention, Partial Retention and Modification." The plan establishes a goal for landscape management to "manage all National Forest lands to obtain the highest possible visual quality, commensurate with other appropriate public uses, costs and benefits."

The VQOs prescribed within the Wallowa-Whitman National Forest are defined by and apply only to lands within the denoted management areas. Each management area has a specific resource emphasis, as well as specific management objective guidelines, to provide protection for the resource. The B2H Project traverses several locations that have overlapping management areas. The LRMP states that within the selected acreages where management areas overlap, the VQOs that provide the highest level of visual quality protection take precedence. For 12 of the 17 management areas, the landscape management prescription is to manage according to forest-wide standards and guidelines. The landscape management prescriptions for the other 5 management areas reference VQOs, as applicable to specific areas. The management areas that would be crossed by the B2H Project include Management Area 1, Management Area 1W, Management Area 3, and Management Area 17. The

portions of these management areas that are crossed by the B2H Project include VQOs of Retention, Partial Retention, Modification, and Maximum Modification.

Umatilla National Forest Land and Resource Management Plan

The Umatilla National Forest LRMP (USFS 1990b) documents forest management direction and addresses management of visual resources as a subset of recreation. Of the 25 management areas within this LRMP, Management Area A3 Viewshed 1 and Management Area A4 Viewshed 2 address the "seen area" from specific viewing platforms where forest visitors have a major concern for the scenic quality of the landscape. Management Area A3 Viewshed 1 identifies 13 viewsheds from primary travel routes, use areas, or waterbodies where forest visitors are expected to have major concern for naturally appearing landscape. These viewsheds have been assigned VQOs of Retention and Partial Retention for the foreground and middleground distance-zone areas, respectively. Management Area A4 Viewshed 2 identifies 17 viewsheds from viewing platforms where forest visitors would have major concern for naturally appearing to slightly altered landscape. Areas within MA A4 Viewshed 2 have been assigned partial retention and modification VQOs for the foreground and middleground distance-zone areas, respectively.

The B2H Project does not directly cross the Umatilla National Forest or the associated Management Areas A3 or A4. Determination of conformance with VQOs within the Umatilla National Forest is therefore not appropriate for this Project.

DEPARTMENT OF DEFENSE

The Navy administers the NWSTF Boardman (Navy 2015). The Navy has not developed a comprehensive plan for the training facility that is comparable to the BLM and USFS management plans. In compliance with the Sikes Act, however, the Navy developed and implemented an integrated natural resources management plan for the facility (Navy 2012). Integrated natural resource management plans are based on ecosystem management principles and provide for management of natural resources, multipurpose use of resources, and public access to resources without inhibiting the military's mission. VRM is included in the Navy's Integrated Cultural Resources Management Plan, as implemented in 2014. This plan addresses management of visual resources in the context of compliance with NHPA Section 106. For the B2H Project, visual impacts on cultural resources will be addressed in the Programmatic Agreement.

BUREAU OF RECLAMATION

Federal lands within the study corridor that are under the jurisdiction of Reclamation include a small portion of the Owyhee River Canyon in Malheur County, Oregon. This area consists of federal project lands associated with Owyhee Dam and Owyhee Reservoir, which are operated by Reclamation. The current management direction for this area is contained in the Owyhee RMP (Reclamation 1994). Associated management direction regarding visual resources consists of general policy statements and does not include site- or area-specific prescriptions. The RMP identifies a goal to "preserve, protect and enhance scenic resources" and objectives to "minimize development in areas that would affect special scenic or wilderness characteristics" and to "maintain primitive, undeveloped character of landscape"

(Reclamation 1994:6–13). Associated management guidelines and actions address facility design, removal of trash dumps and other restoration actions, and aesthetic requirements to be applied to leaseholders.

There are other Reclamation property interests in Morrow and Union counties in Oregon and Owyhee County in Idaho. These properties do not have specific or general management guidelines associated with visual resources.

U.S. Fish and Wildlife Service

The USFWS manages three national wildlife refuges that are located partially or entirely within the B2H Project area: the Umatilla National Wildlife Refuge (NWR) in Morrow County, the McKay Creek NWR in Umatilla County, and the Deer Flat NWR in multiple counties of southwestern Idaho and southeastern Oregon. No VRM direction has been determined for USFWS lands within the study corridor.

Bonneville Power Administration

The BPA manages lands associated with the Longhorn Substation. BPA does not have specific or general management guidelines associated with visual resources.

Confederated Tribes of the Umatilla Indian Reservation

The CTUIR is within the study corridor for visual resources. The Umatilla Indian Reservation includes a variety of landscape types, from broad agricultural plains to enclosed landscapes of rounded mountains with incised drainages. In the CTUIR's 2010 Comprehensive Plan, no specific references are made to visual resources or objectives identified for management of visual resources.

State Lands

State lands within the study area are located within Idaho and Oregon, and are owned by each state, respectively. Lands within the study corridor that are owned by Oregon are managed by the ODOT, the Oregon Parks and Recreation Department (OPRD), and the ODFW. Lands administered by the ODOT are within highway rights-of-way and are managed for transportation purposes – not including specific management of visual resources. The lands administered by the OPRD and the ODFW are somewhat more extensive and varied; the types of management designations and resource management approaches under the jurisdiction of these agencies are summarized below.

Oregon Parks and Recreation Department

The mission of the OPRD is to provide and protect outstanding natural, scenic, cultural, historic, and recreational sites for the enjoyment and education of present and future generations (OPRD n.d.). The department's resources within the B2H Project area include portions of the Blue Mountain Scenic Byway located along I-84 and the Old Oregon Trail Highway. These parcels extend from Deadman's Pass Rest Area in Umatilla County south to Spring Creek in Union County. The corridor protects one of the few undisturbed, mature evergreen forests along I-84 (OPRD n.d.). Hilgard Junction State Park, located in Union County 8 miles west of La Grande at the intersection of I-84 and Oregon State

Highway 244 near the Grande Ronde River, also lies within the B2H Project area. This park offers recreational opportunities and tent camping sites along the Grande Ronde River (OPRD 2014).

The OPRD operates three park units in the eastern part of the study corridor in Oregon. Farewell Bend State Recreation Area is located 3 miles southeast of Huntington in Baker County, along the west bank of the Snake River's Brownlee Reservoir. Lake Owyhee State Park, located 33 miles southwest of Nyssa in Malheur County, includes two campgrounds and a day-use area with a boat ramp. Succor Creek State Natural Area, located approximately 20 miles south of Adrian in Malheur County, includes an unstaffed, no-fee primitive camping area with 67 sites.

The OPRD has prepared master plans for a number of state park system units. However, the list of draft and completed park master plans available on the department's website does not include any of the four park units within the study corridor. Based on the planning documentation available to date, specific management direction for visual resources associated with these parks has not been established.

The OPRD also has a State Designated Scenic Bikeway program. These routes are claimed to represent the "best of the best road biking in all of Oregon." Each designated bikeway has undergone an application, approval, and planning process. This process revolves around a number of desired features, including the following basic characteristics that relate to visual resources:

- Natural scenery with dramatic and diverse views of mountain, forests or deserts, wildlife, lakes, and rivers
- Human-made scenery with multiple opportunities to experience a variety of points of interest, such as buildings, heritage sites, or expansive agricultural landscapes

One scenic bikeway, known as the Grande Tour Bike Route, is located within the study corridor. This route was designated in a figure-8 configuration and is 134 miles long. Important views from this bikeway include views of the Elkhorn Range, Blue Mountains, Eagle Caps, and Wallowa Mountains, along with views of clear streams and serene farmlands, towering windmills, and sweeping sagebrush rangelands. No specific management direction has been determined for the Grande Tour Bike Route.

OREGON DEPARTMENT OF FISH AND WILDLIFE

The ODFW manages state wildlife areas primarily to provide wildlife habitat, with recreational use as an incidental benefit in some locations. Five state wildlife areas are located within the B2H Project area, including Coyote Springs Wildlife Area in Morrow County; Ladd Marsh Wildlife Area in Union County; Elkhorn Wildlife Area in Union and Baker counties; Snake River Islands Wildlife Area in Malheur County; and Rogers Wildlife Area, a small property of roughly 100 acres, in Malheur County. Public use for wildlife-oriented recreation is permitted in all of these wildlife areas, with some use restrictions based on type of use, geographic extent, and/or season. Management plans are available for the Columbia Basin Wildlife Areas, including Coyote Springs (ODFW 2008a); the Elkhorn Wildlife Area (ODFW 2006); and the Ladd Marsh Wildlife Area (ODFW 2008b). The management plans focus on habitat and wildlife management and do not address management for visual resources.

OTHER MANAGED VISUAL RESOURCE PROGRAMS

Scenic and Back Country Byways

The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. Established in U.S.C. Title 23, Section 162, under the Intermodal Surface Transportation Efficiency Act of 1991, the program was developed to help recognize, preserve, and enhance selected roads throughout the U.S. by establishing certain roads as National Scenic Byways or All American Roads based on their intrinsic qualities (Table 3-400). To be designated a National Scenic Byway, a road must possess characteristics of regional significance in at least one of the intrinsic qualities. All American Roads must possess characteristics of national significance in at least two of the intrinsic qualities. Scenic byways can qualify for Federal Highway Administration funding under two programs—the Federal Lands Access Program or the Federal Lands Transportation Program, in which the federal agencies, along with the state department of transportation and counties, compete for funding. Details on funding as enacted in the Moving Ahead for Progress in the 21st Century Act (Public Law 112-141), MAP-21, can be found here: http://www.fhwa.dot.gov/map21/. America's Byways is the umbrella term used for the collection of the 150 distinct and diverse roads currently designated by the U.S. Secretary of Transportation.

Table 3-400. National Scenic Byway Program Intrinsic Qualities Description

Intrinsic Quality	Description
Archaeological	Archaeological Quality involves those characteristics of the scenic byways corridor that are physical evidence of historic or prehistoric human life or activity that are visible and capable of being inventoried and interpreted.
Cultural	Cultural Quality is evidence and expressions of the customs or traditions of a distinct group of people. Cultural features include crafts, music, dance, rituals, festivals, speech, food, special events, and vernacular architecture and are currently practiced.
Historic	Historic Quality encompasses legacies of the past that are distinctly associated with physical elements of the landscape, whether natural or man-made, that are of such historic significance that they educate the viewer and stir an appreciation for the past. The historic elements reflect the actions of people and may include buildings, settlement patterns, and other examples of human activity.
Natural	Natural Quality applies to those features in the visual environment that are in a relatively undisturbed state. These features predate the arrival of human populations and may include geological formations, fossils, landforms, waterbodies, vegetation, and wildlife.
Recreational	Recreational Quality involves outdoor recreational activities directly associated with and dependent on the natural and cultural elements of the corridor's landscape. The recreational activities provide opportunities for active and passive recreational experiences.
Scenic	Scenic Quality is the heightened visual experience derived from the view of natural and man-made elements of the visual environment of the scenic byway corridor. The characteristics of the landscape are strikingly distinct and offer a pleasant and memorable visual experience.

Table Source: Federal Highway Administration 1995

Initiated in 1989, BLM's Back Country Byway Program is a component of the National Scenic Byways Program. The National Back Country Byway Program functions as BLM's contribution to the larger National Scenic Byways Program as a whole, and the Back Country Byways are designated by BLM

State Directors on BLM public lands. BLM has established four category types of back country byways based on the accessibility of the routes; these types are provided in Table 3-401.

Individual states also have developed programs to recognize and manage outstanding scenic routes as well as other qualities similar to the National Scenic Byways Program. The Idaho Transportation Department was designated by the governor as the lead agency responsible for administering the Idaho Scenic Byways Program to meet the requirements of the Intermodal Surface Transportation Efficiency Act of 1991. The Oregon Scenic Byways Program was created also as an opportunity for Oregon to take advantage of the national program defined under this act. The Oregon program includes two categories of routes: scenic byways and tour routes. Oregon scenic byways must be a minimum of 30 miles in length and include outstanding scenic roads that accommodate most travelers. Tour routes must be a minimum of 20 miles in length and include unique regional features or points of interest that draw people out of their vehicles, and tour routes also may have some form of limited drivability (Oregon Scenic Byways Program 1995).

Table 3-401. Bureau of Land Management Back Country Byways Category Types

Type	Description
Type I	Roads are paved or have an all-weather surface and have grades that are negotiable by a normal touring car. These roads usually are narrow, require a slow speed, and are secondary roads.
Type II	Roads require high-clearance type vehicles, such as trucks or vehicles with 4-wheel drive. These roads usually are not paved but may have some type of surfacing. Grades, curves, and road surface are such that they can be negotiated with a 2-wheel-drive high-clearance vehicle without undue difficulty.
Type III	Roads require 4-wheel-drive vehicles or other specialized vehicles, such as dirt bikes or all-terrain vehicles. These roads usually are not surfaced but are managed to provide for safety considerations and resource protection needs.
Type IV	Trails are managed specifically to accommodate dirt bike, mountain bike, snowmobile, or all-terrain vehicle use. These trails usually are single-track trails.

Table Source: Bureau of Land Management 2004

In the B2H Project area, there is one designated All American Road, one National Scenic Byway, five state scenic byways, one tour route, and one back country byway (Table 3-402, Map 3-4, and MV-23).The Hells Canyon Scenic Byway, Blue Mountain Scenic Byway, Elkhorn Scenic Byway, and Journey through Time Scenic Byway and Grande Tour Route are all considered to be both Oregon Scenic Byways and Wallowa-Whitman National Forest Scenic Byways. Some portions of different byways overlap and share segments of the same routes (e.g., the Snake River-Mormon Basin Back Country Scenic Byway overlaps with a portion of the Hells Canyon Scenic Byway along Oregon Route 86). Hells Canyon Scenic Byway is a 208-mile-long All American Road along portions of Oregon Routes 86 and 82 within the B2H Project area whose route takes motorists along the 8,000-foot-deep Hells Canyon and the 10,000-foot peaks of the Wallowa Mountains. The Blue Mountain Scenic Byway (Oregon Route 74 within the B2H Project area) is a 145-mile-long alternative route to I-84 between Arlington and Baker, providing glimpses of the pioneer history of the area, as well as spectacular scenery. The winding 106-mile loop of the Elkhorn Scenic Byway follows U.S. Route 30 and Forest Road 73 within the B2H Project area, encircles the Elkhorn Mountains, and passes by abandoned gold mines and ghost towns. Following a 100-mile segment of the Wild and Scenic John Day River, the

Journey through Time Scenic Byway (Oregon Route 7 within the B2H Project area) is a 285-mile-long route that provides opportunities for motorists to view many aspects of Oregon pioneer life and well-preserved fossil records of plant and animals dating back 54 million years ago.

Table 3-402. Scenic and Back Country Byways in the Study Corridor

Intrinsic Qualities	Corridor Management Objectives	Corridor Management Proposed Enhancement Projects
Blue Mountain Scenic Byway (Oregon)		
Scenic, historic, and recreational	• Provide long-lasting economic support for local communities along the route • Assist in enhancing the production of outdoor recreation opportunities • Link people and resources through a natural and historical journey	No projects identified in the byway's 2004 Corridor Management Plan
Elkhorn Scenic Byway (Oregon)		
Scenic, historic, natural, and recreational	• Increase public understanding and appreciation for the nation's environment, history, and culture • Reveal a modern working forest steeped in history	No projects identified in the 1994 Scenic Byway Management Plan
Grande Tour Route (Oregon)		
Scenic, historic, and natural	• Strengthen local economies • Build a bridge between urban and rural residents • Preserve and maintain the area's history • Provide opportunities for education	• Interpretive signs • Marketing strategy
Hells Canyon All American Road (Oregon) [also known as the Hells Canyon Scenic Byway]		
Scenic, natural, historic, and recreational	• Showcase the unique, diverse, and outstanding scenery in Northeast Oregon • Stimulate the local economies of Northeast Oregon in all seasons • Upgrade and improve public land facilities • Maintain the remote and rugged character that is significant to the rural lifestyle • Develop the byway around the interpretive themes	No projects identified in the byway's 2004 Corridor Management Plan
Journey Through Time Scenic Byway (Oregon)		
Scenic, natural, and historic	• Serve to enhance and protect the valuable heritage resources along the unique corridor • Provide a source of economic vitality for the region • Create jobs • Maintain rural lifestyles • Protect important values • Build identity for the North-Central Region	No projects identified in the byway's 1996 Management Plan
Lewis and Clark Trail Scenic Byway (Washington)		
Scenic, natural, historic, cultural, and recreational	• Leave a lasting legacy of improvements • Enhance visitors' experience Encourage development of plans and projects that are	Priority Bicentennial Projects in the vicinity of the study corridor: • #3 Sacajawea State Park and

Table 3-402. Scenic and Back Country Byways in the Study Corridor

Intrinsic Qualities	Corridor Management Objectives	Corridor Management Proposed Enhancement Projects
	consistent with the values and perspectives of tribes and local communities along the trail route • Relate the significance of and provide interpretation about the Lewis and Clark Expedition to people of the Pacific Northwest, the nation, and the world	Interpretive Site, Tri-Cities area • #8b Lewis and Clark Discovery Trail/Pacific County Phase • #9 Confederated Tribes of Umatilla Homelands Project, Umatilla and Morrow counties, Oregon, and Southeast Washington • #15c Sacajawea Heritage Trail and related sites, Tri-Cities • #20 Wanapum Replica Village, Tri-Cities area
Snake River Canyon Scenic Byway (Idaho)		
Scenic, natural, archaeological, cultural, and recreational	• To continually improve the byway experience for all visitors • To provide diverse and interesting sites and information that offer quality experiences • To offer all visitors an appreciation and understanding of the historic, cultural, recreational, scenic, natural, and archaeological stories along the byway	Key site improvements identified at Walter's Ferry; Pump Road Overlook; Map Rock Interpretive Site; cities of Marsing, Greenleaf, Wilder, Caldwell, Nampa, and Homedale; rural farm stands and farmers' markets; vineyards and wineries; Hops Fields and City of Wilder; Old Fort Boise Replica and City of Parma; and the Fort Boise Wildlife Management Area
Snake River-Mormon Basin Back Country Byway (Oregon)		
Scenic, natural, recreational, and historic	• Maintain scenic values • Encourage tourism as a way to diversify the economic base of local governments • Promote use and enjoyment of recreation areas	Additional signage
Western Heritage Historic Byway (Idaho)		
Scenic, natural, and historic	• To preserve, enhance, and showcase select geologic, wildlife, scenic, historic, cultural, and recreational resources along the byway, while respecting local residents and lifestyles • To attract local, regional, national, and international visitors to southwest Idaho to enjoy rewarding and memorable experiences of the people and places along the byway • To provide visitor services that consider access, safety, and convenience for people of all ages • To maintain the byway's unique cooperative partnership of local, state, private, and federal agencies in implementing byway improvements	Projects identified in the 2004 Western Heritage Historic Byway Corridor Management Plan: • Byway Orientation Portal • Kuna/Indian Creek Visitor Center • Snake River Birds of Prey National Conservation Area Pullout • Initial Point • Snake River Birds of Prey National Conservation Area/Dedication Point • Pioneer Cemetery/15-Mile Station • Kuna Cave • Snake River Birds of Prey National Conservation Area/Three Pole • Swan Falls Dam • Celebration Park • Melba Loop • Silver Trail

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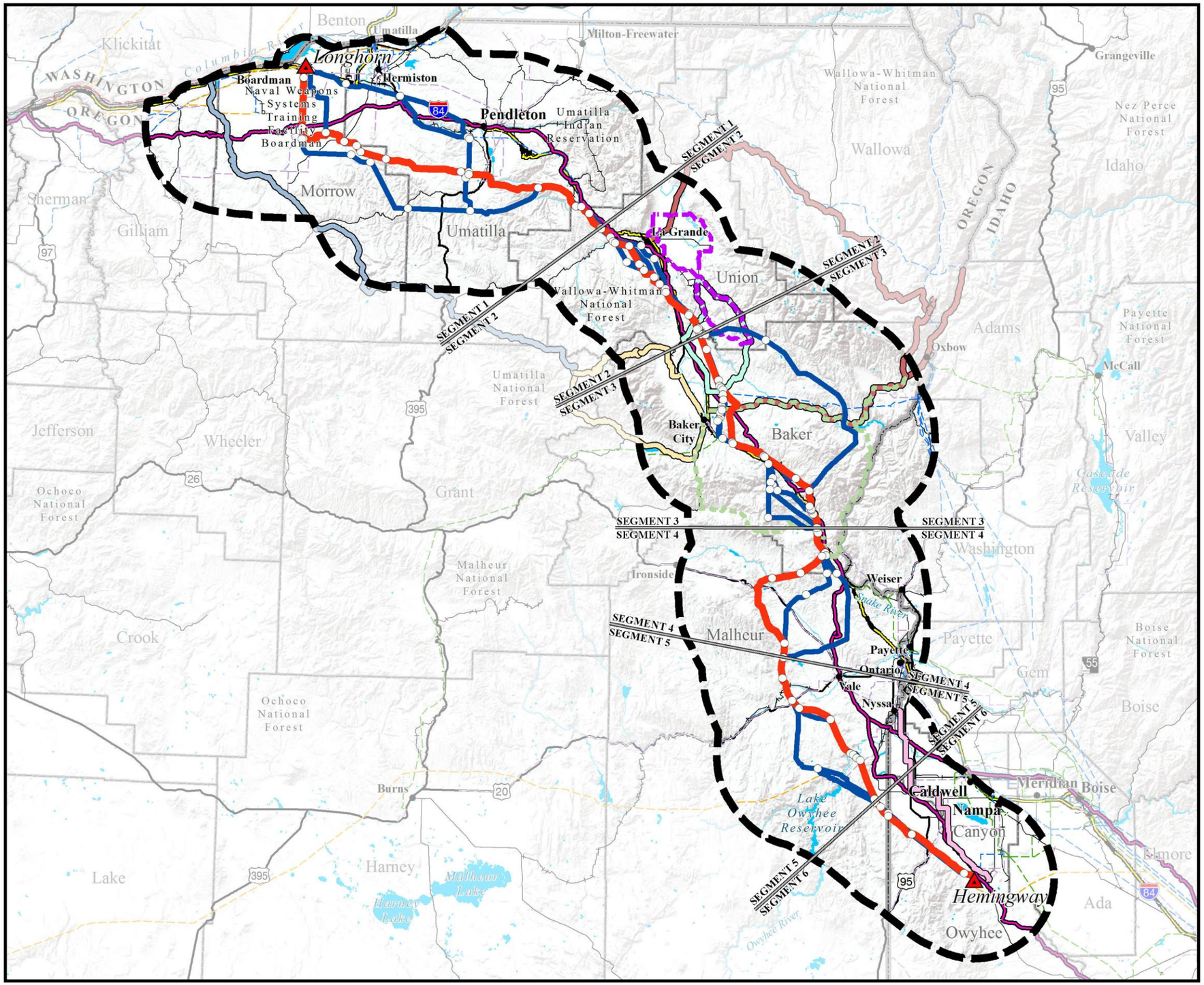

Map 3-4

Scenic Byways, Back Country Byways, and Scenic Bikeways

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Scenic Byways, Back Country Byways, and Scenic Bikeways

- Blue Mountain Scenic Byway
- Elkhorn Drive Scenic Byway
- Grand Tour Route Scenic Bikeway
- Grand Tour Auto Route
- Hells Canyon All American Road
- Snake River Canyon Scenic Byway
- Snake River-Mormon Basin Back Country Byway

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Line

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Scenic Byways or Backways, BLM 2015, Oregon DOT 2008, Washington DOT 2012; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10 20 30 40
Miles
1:1,393,920 or 1 inch = 22 miles

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The 80-mile-long Grande Tour Route climbs across mountains and open valleys and overlooks the Ladd Marsh Wildlife Refuge using Oregon Routes 82, 203, and 237 within the B2H Project area. A high-clearance vehicle is needed to travel the entire route of the BLM's Snake River-Mormon Basin Back Country Byway in northeast Oregon. The byway, which begins and ends in Baker City, forms a 150-mile-long loop drive along portions of Oregon Routes 7 and 86 within the B2H Project area. In Idaho, the 53-mile-long Snake River Canyon Scenic Byway crosses a sagebrush-covered valley rich in early settlement history and uses Idaho Route 45 and local roads within the B2H Project area. The byway also crosses the Deer Flat NWR. The Western Heritage Historic Byway is a 40-mile route along the Snake River in Idaho and is a designated National Scenic Byway. The B2H Project area also includes a small portion of the Lewis and Clark Trail Scenic Byway along Washington Route 14, which is more than 570 miles in length and parallels the Columbia River.

NATIONAL HISTORIC TRAILS

Refer to Section 3.2.15.2 of the EIS for a description of the NHTs within the study corridor.

WILD AND SCENIC RIVERS

Refer to Section 3.2.11 of the EIS for a description of the designated Wild and Scenic Rivers within the study corridor.

LOCAL GOVERNMENT LANDS

Counties and incorporated communities collectively own a small acreage of land within the study corridor, most of which is associated with public facilities, utility operations, and open space areas that these entities provide for their residents. The study corridor for this report includes all county and municipal lands where the proposed transmission line would be located, as well as nearby counties and municipalities within a 5-mile radius of the proposed transmission line. Review of county and municipal comprehensive plans for the respective jurisdictions indicates that the plans provide overall management direction for these local government lands but does not prescribe management direction specific to visual resources. Note, visual resources were inventoried and assessed on local governmental lands in a consistent manner as used for other lands.

PRIVATE LANDS

Private lands crossed by the Proposed Action or an alternative route are not subject to the VRM standards that federal or state land-managing agencies would apply. Private lands within the study corridor are subject to land-use regulation of the respective local government jurisdiction (i.e., county or municipality) within which they are located. As noted above, review of local government land-use plans applicable to the potential transmission line locations confirms that these local governments have not established VRM systems for the private lands under their jurisdiction. While local zoning ordinances typically include regulatory provisions that relate to aesthetic or visual concerns, such as height limitations for structures, the local governments do not classify private lands according to their visual resource attributes and do not prescribe levels of visual quality that must be maintained in specific

locations. Note, visual resources were inventoried and assessed on private lands in a consistent manner as used for other lands.

3.2.12.3 Issues Identified for Analysis

During scoping, issues related to visual resources were raised by the public, Native American tribal governments, and federal and state agencies. The following list summarizes the specific issues identified during scoping, as well as the issues that must be considered as required by applicable laws and regulations.

- Concerns related to whether scenic views would be affected by the electrical towers
- Concerns about whether construction of the transmission line would affect visual resources near the Oregon NHT and the National Historic Oregon Trail Interpretive Center
- Concerns related to whether the B2H Project would affect designated scenic byways
- Concerns regarding whether the B2H Project would conform to existing federal VRM objectives

3.2.12.4 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project on visual resources.

The methods used to analyze the impacts on visual resources from the construction and maintenance of the B2H Project followed three primary steps: (1) establishing existing visual character and inherent scenic quality and identifying locations where people commonly view the landscape, (2) assessing the potential change to the landscape and the effects on views from key viewing locations, and (3) determining compliance with federal resource management objectives.

The inventory and analysis of the visual resources was completed for all lands in the study corridor, regardless of jurisdiction or land ownership. The character of the existing visual resources in the study corridor varies based on the different natural and man-made features or elements in the landscape, as well as the diverse patterns that these elements create when combined. Scenic or visual quality represents the visual appeal of a landscape. The landscape is measured in terms of its distinctiveness; its scarcity; and the variety of the landform, vegetation, water, color, adjacent scenery, and man-made features and how well all of these features work together. The visual character and inherent scenic quality of the visual environment was evaluated using visual analysis units (VAU). Each unit includes similar landforms, vegetation, land use, or man-made patterns and features or contains water features, such as rivers and lakes.

In addition to establishing VAUs to evaluate existing landscape character and scenic quality, specific locations where people view the landscape also were identified. These locations were classified as stationary and linear viewing platforms. Stationary viewing platforms are specific points within the landscape from which the public views the landscape, such as a scenic overlook or interpretive site. Linear viewing platforms, however, are described as roads or trails from which viewers are generally

moving along a given path. Special Management Areas (SMAs) that include management objectives for scenic values also were identified, and the views from these areas were evaluated. Visibility analyses were conducted looking out from each Sensitive Viewing Platform to determine where the B2H Project could be seen.

Visual effects are defined as changes to the visual environment that result from the introduction of modifications to the landscape. An analysis of visual dominance, scale, and contrast was used to determine to what degree the B2H Project would attract attention and to assess the relative change in character as compared to the existing characteristic landscape and its inherent scenic quality. The amount of visual contrast created is directly related to the amount of attention that is drawn to a feature in the landscape.

The third step in the analysis of visual impacts was the determination of conformance with USFS and BLM VRM objectives where the B2H Project would cross federally administered lands. The potential impacts on scenic byways and scenic bikeways also are addressed in this section.

DATA SOURCES

Data for this section were collected from the BLM, the USFS, Visual Resource Report 1, and numerous open sources. Data provided by the BLM included information related to VRIs, field office boundaries, SMAs, and VRM Classes. The USFS provided data related to its visual inventories, VQOs, and USFS roads. Sensitive Viewing Platform-related data, initial contrast-rating forms, and initial site photos were all sourced from Visual Resource Report 1. Data collected from open sources included information related to scenic byways, back country byways, and scenic bikeways.

ANALYSIS AREA

The study corridor for visual resources is defined as the area within 5 miles of either side of the B2H Project's centerlines (10 miles total). The study corridor is located within portions of southwestern Idaho and eastern Oregon, including sections of Gilliam, Morrow, Umatilla, Union, Baker, and Malheur counties in Oregon and Washington, Canyon, and Owyhee County in Idaho. The most southern end of Benton County near the Columbia River in Washington also is part of the study corridor.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Table 3-403 defines the criteria for assessing the level of impacts on visual resources, which are based on thresholds for visual impacts on views from viewing platforms and on the existing landscape's scenic quality and landscape character.

Table 3-403. Criteria for Assessing Level of Impacts on Visual Resources		
Level of Impacts	**Contrast Perceived by Viewers (Scale/Spatial Relationship)**	**Magnitude of Change to Landscape Character and Scenic Quality**
Low	• B2H Project components would either repeat elements/patterns common in the landscape, or would introduce elements/patterns common in the landscape. that would be visually subordinate • B2H Project components would either not be visually evident, or would create weak contrast as compared to other features in the landscape.	• Subtle to notable change • Landscape would either appear to be intact and not attract attention, or would be noticeably altered and begin to attract attention • B2H Project components would either repeat form, line, color, texture or scale common in the landscape and not be visually evident – or the B2H Project components would introduce form, line, color, texture, or scale common in the landscape and would be visually subordinate (low contrast) • There would be no apparent change in scenic quality
Moderate	• B2H Project components would introduce elements/patterns not common in the landscape. • B2H Project components would be visually prominent in the landscape and would create moderate contrast as compared to other features in the landscape.	• Landscape would appear to be substantially altered • There would be a substantial change in scenic quality • B2H Project components would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape (moderate contrast) • B2H Project components would attract attention • B2H Project components would begin to dominate the visual setting • There would be a negative change in scenic quality rating of 1.0 from existing conditions based on the setting the B2H Project sits in as defined by the viewshed and surrounding land-use composition
High	• B2H Project components would introduce elements/patterns that would be visually dominant and create strong contrast as compared to other features in the landscape.	• Landscape would appear to be severely altered • There would be a severe change in scenic quality • B2H Project components would introduce form, line, color, texture or scale not common in the landscape and would be visually dominant in the landscape (strong contrast) • B2H Project components would demand attention • Negative change in scenic quality rating of 1.5 or more from existing based on the setting the B2H Project sits in as defined by the viewshed and surrounding land-use composition • B2H Project components would dominate in the visual setting

Effects Analysis

Assessment of Initial Impacts

Initial impacts on visual resources were assessed with regard to landscape character and scenic quality, and Sensitive Viewing Platforms within the study corridor. The following subsections provide a description of the methods and techniques employed for this assessment.

Landscape Character and Scenic Quality

Landscape character is defined as the actual physical characteristics of the landscape, while scenic quality is an evaluation of the relative value of those physical characteristics. For this analysis, potential impacts on landscape character and scenic quality include physical changes that would occur within the footprint of the B2H Project and on areas that would have views of the B2H Project components.

Because scenic quality impacts would lessen over distance (i.e., potential changes to the landscape are generally more visually evident when they are closer to a particular viewing location), these effects are assessed separately based on distance zones. Two primary distance zones were used in the analysis. The foreground distance zone was defined as the area up to 0.5 mile from the proposed alternatives, and the middleground distance zone was the area extending from 0.5 mile to 5.0 miles.

Initial impacts on the landscape character and scenic quality within the B2H Project area were assessed by determining the magnitude of change expected to occur to the lands within each VAU, regardless of specific viewing locations. The magnitude of change was analyzed based on a combination of fieldwork efforts and desktop analysis and included a determination of potential impacts on different distance-zone areas for the areas within each VAU where the B2H Project could be seen. Using ArcView Spatial Analyst, viewshed analyses were conducted to determine what areas of this landscape could have views of each alternative. These viewshed analyses covered the extent of the visual resources study corridor, a distance of 5 miles on either side of the centerline of each alternative alignment. The analyses were completed based on best available digital elevation model (DEM) data for the area. This type of viewshed analysis also is commonly referred to as a “bare earth” analysis, as it does not reflect existing vegetation or structures that could obstruct potential views of the proposed alternatives. Bare earth analyses, therefore, reflect the worst-case scenario in determining the potential visual impacts. Existing vegetation may help to minimize the impacts by screening views of the B2H Project.

Potential impacts on VAUs are reflected by B2H Project segment and by alternative and are based on the criteria provided in Table 3-403 (Criteria for Assessing Level of Impacts on Visual Resources). Based on the criteria, the level of impact on scenic quality rating scores also was determined. These potential changes in scenic quality rating scores also are associated with the number of visible acres within each VAU, providing a quantification of potential scenic quality impacts. Impacts associated with landscape character and scenic quality are depicted on MV-22.

An additional analysis has also been completed to disclose potential impacts on the scenic quality ratings of BLM scenic quality rating units (SQRU) that the project alignments would cross. This desktop analysis is focused on the potential change in cultural modification score based on the original SQRU boundaries (not limited to the 5-mile buffer that represents the visual analysis area). This analysis is presented in tabular format within Appendix H, and is based on the SQRU scores provided in the VRI reports for the Malheur and Owyhee Field Offices.

Sensitive Viewing Platforms

The analysis of initial impacts on views focuses on locations from which the public could have views of the B2H Project and on whether these views could be adversely modified through the introduction of B2H Project components into the public’s viewshed. The viewing locations, or Sensitive Viewing Platforms, analyzed included both linear and stationary viewing platforms, SMAs, residences within 0.25 mile of the alternative alignments, and official boundaries of incorporated towns and cities. Impacts related to viewers are depicted on MV-23.

The assessment of potential effects on viewing platforms began with a baseline analysis of the degree of contrast expected from B2H Project components. This analysis included an assessment of both structure contrast and landscape contrast. Structure contrast is a determination of expected degrees of contrast between proposed aboveground facilities and their relationship to existing built features, while landscape contrast is an analysis of expected degrees of change to the existing landforms and vegetation types through the construction of access roads and tower pads as well as right-of-way vegetation clearing. These analyses are conducted using predictive GIS modeling and result in a depiction of expected degrees (high, moderate, or low) of overall B2H Project-related contrast along each alternative alignment. The varying degrees of B2H Project contrast are then combined with distance-zone offsets from each viewpoint considered within the analysis. These viewer-related distance zones, otherwise known as viewer influence zones, represent decreasing degrees of visual influence that the B2H Project would have on views as distance from the viewing locations increases. Five influence zones were used for this analysis: 0 to 0.5 mile; 0.5 to 1 mile; 1 to 2 miles; 2 to 3 miles; and 3 miles and greater.

The combination of B2H Project contrast and viewer influence zones results in a representation of overall viewer impacts that can be directly correlated to portions of the alternative alignments. Viewshed analyses from each viewing platform also are considered during this assessment to accurately reflect portions of the alternative alignments that would not be seen from the viewing platforms. The results of this analysis are included for each alternative alignment by segment—providing the miles of impacts on viewing locations by alternative route.

From an organizational standpoint, the Sensitive Viewing Platform types are discussed in the analysis relative to their relationship to residences, recreational use, and general travel routes. Stationary viewing platforms considered in the analysis include both residences and recreational uses. Residential users are represented by several datasets within the analysis, including stationary platforms that were chosen to represent communities, residential areas, or individual homes or ranches; best available data for residences within 0.25 mile of the alternatives; and boundaries of incorporated communities. Recreational uses represented by stationary viewing platforms include stationary Sensitive Viewing Platforms, such as trailheads, scenic viewpoints, parks, interpretive sites, campgrounds, and dispersed recreation points.

Linear viewing platforms considered within the analysis include either sensitive routes or highly used travel routes, or both, in addition to routes that have a specific recreational use, such as scenic byways and scenic bikeways. SMAs, however, generally are based on recreational uses, including dispersed wilderness recreation, as well as scenic driving, hiking, and viewing uses.

In addition to the assessment of the overall viewer impacts discussed above, each of the stationary platforms, linear viewing platforms, and SMAs were analyzed individually based on the criteria defined in Table 3-403. These analyses considered a number of environmental factors in the overall determination of perceived contrast. The key factors considered include the visibility conditions, angle of view, and duration of view. Each of these environmental factors can influence the amount of visual contrast, dominance, and level of attraction introduced by B2H Project components.

Visibility conditions refer to how B2H Project components in the landscape would be viewed from viewing platforms, as opposed to simply whether the B2H Project would be seen from the platforms. These conditions are assessed by noting the juxtaposition of the B2H Project components in the landscape. One condition considered is whether B2H Project components would be seen predominantly skylined (silhouetted above the landforms) or backdropped against landforms. The second condition is whether the views of B2H Project components would be predominantly unobstructed or partially obstructed. The third visibility condition takes into account whether views of B2H Project components would be predominantly continuous (landforms or other features would be viewed over a distance) or intermittent/discontinuous (landforms or other landscape features would break up or obstruct the view of B2H Project components). Refer to Figure 3-1 for a photographic example of visibility conditions.

Figure 3-1. Example of Visibility Conditions

Figure Note: Photograph depicts a transmission line whose visibility conditions are characterized as skylined, unobstructed, and continuous from this viewpoint.

The views from Sensitive Viewing Platforms also can be affected by the angle of view, which is considered differently for linear and stationary platforms. The angle of view from linear viewing platforms is considered in terms of viewer position and view orientation. View orientation from linear viewing platforms is categorized as predominantly “head-on” views (directly in front of the viewer) or parallel views (tangential to the viewer) from linear viewing platforms. In contrast, the angle of view from stationary platforms is considered in relation to the degree of exposure within the 360 degrees of potential viewing area—that is, how much of the B2H Project components would be seen if viewers were to turn in a complete circle. The angle of view from stationary platforms also is evaluated to determine whether the B2H Project components would be seen in the same viewing direction as the primary feature, if there is one. For example, at a scenic overlook with a view of a landmark feature, the

evaluation would document whether the B2H Project components would be seen as part of the typical view of the landmark. Viewer position for both linear and stationary platforms is characterized as superior to (above), neutral to, or inferior to (below) the B2H Project components. Refer to Figure 3-2 for a photographic example of viewer position and view orientation conditions along a linear viewing platform.

Figure 3-2. Example of Viewer Position and Orientation Conditions along Linear Viewing Platform

Figure Note: Photograph depicts a neutral viewer position for motorists along the road, meaning that the base of the towers and the road are relatively at the same level or elevation. The motorists along this section of the road generally have parallel views of the towers and transmission lines.

The duration of view—that is, how long, in time or distance, B2H Project components would be seen from Sensitive Viewing Platforms—also is considered in determining the magnitude of potential impacts on the views from linear and stationary platforms. For linear viewing platforms, the duration of view considers the percentage of the total travel time along the platform during which the B2H Project components would be seen, the percentage of the total travel distance (miles) along the platform from which the B2H Project components would be seen, and the percentage of the total miles of the B2H Project components that would be seen along the platform. For stationary platforms, the duration of view is considered in terms of percentage of the total miles of the B2H Project components that would be seen from the platform.

The last two environmental factors considered in this analysis—scale and spatial relationship—represent a culmination of the other factors and are, therefore, an evaluation of the total degree of contrast (prominence) of the B2H Project components in relation to the surrounding landscape when viewed from linear and stationary viewing platforms. More specifically, scale refers to the size of the

B2H Project components relative to various landscape features. For example, the larger the B2H Project components appear in relation to the existing landscape features, the less they would repeat the common elements and patterns in the surrounding landscape and the more they would appear to dominate the landscape.

In addition to scale, the arrangement or spatial relationship of landscape features also can affect the visual prominence of B2H Project components when viewed from Sensitive Viewing Platforms. Consideration of the amount of visual contrast created is directly related to the amount of attention that is drawn to an element in the landscape. For this analysis, contrast is assessed by comparing the B2H Project components with the major features in the existing landscape. Refer to Figure 3-3 for a photographic example of scale and spatial relationship.

Figure 3-3. Example of Scale and Spatial Relationship

Figure Note: Photograph depicts a neutral viewer position for motorists along the road, meaning that the base of the towers and the road are relatively at the same level or elevation. The motorists along this section of the road generally have parallel views of the towers and transmission lines.

Impacts from the B2H Project also were evaluated in terms of the impacts over time. For this analysis, short-term impacts are defined as effects that would last less than 5 years and long-term impacts are defined as effects that would last more than 5 years, as outlined in Section III.D.1 of BLM Handbook H-8431-1 (BLM 1986a).

Potential impacts on stationary platforms, linear viewing platforms, and SMAs related to NHTs are included in Section 3.2.15.

Conformance with Management Objectives

The assessment of conformance with management objectives provides a determination of whether the modifications introduced by the B2H Project would be consistent with existing land management objectives related to scenery. This assessment includes assessment of conformance with management objectives for lands managed by both the BLM and USFS, in addition to objectives associated with scenic byways, back country byways, and scenic bikeways. The assessment of conformance with management objectives is depicted on MV-24.

Conformance with BLM VRM class objectives is directly related to the anticipated degree of contrast expected from each viewing platform that the BLM has determined to be a BLM Sensitive Viewing Platform. The BLM's standard degrees of contrast (strong, moderate, weak, and none) align with the criteria defined in Table 3-403 Accordingly, a high degree of impact (strong contrast) would conform only with VRM Class IV; a moderate degree of impact (moderate contrast) would conform with VRM Classes IV or III; a low degree of impact (weak contrast) would conform with VRM Classes IV, III, or II; and a degree of contrast with "no impacts" (no contrast, or "none") would conform with VRM Classes IV, III, II, and I.

Each of the BLM-related viewing platforms is included within the viewing platform tables in the analysis and includes a determination of conformance for each VRM class that would be visible from the respective platform. Per the requirements in BLM Manual 8400, a contrast-rating form also was completed for each BLM Sensitive Viewing Platform. These rating forms are provided in Appendix H and include specific explanations regarding the anticipated level of contrast for each Sensitive Viewing Platform, as well as specific mitigation measures to reduce the amount of potential impact. It is important to note that although all NHT-related visual impact descriptions are located in Section 3.2.15, information about conformance related to NHT-related BLM Sensitive Viewing Platforms has been included in this section of the document to keep all BLM conformance issues organized within one specific section of this EIS.

USFS-related conformance instead was based on potential impacts on landscape character and, therefore, draws directly from the impacts anticipated on scenic quality within the foreground distance zone of each VAU. These results are included by segment in the USFS conformance tables for each alternative alignment. The level of impact (high, moderate, low, and none) defined in Table 3-403 align with USFS VQOs to determine conformance with management objectives. A high degree of impact would conform only with Maximum Modification; a moderate degree of impact would conform with both Maximum Modification and Modification; a low degree of impact would conform with Maximum Modification, Modification, and Partial Retention; and a degree of impact with "no impacts", or "none" would conform with Maximum Modification, Modification, Partial Retention, and Retention.

Because scenic byways, back country byways, and scenic bikeways within the study corridor do not have specific thresholds for conforming to management objectives, conformance associated with these route designations is discussed narratively within the analysis based on the goals or objectives of these specially designated routes.

Mitigation Planning and Effectiveness

Design features of the B2H Project for environmental protection are part of the B2H Project description and would be applied to reduce potential impact levels. These design features include key design elements such as the use of non-specular conductors, a dulled galvanized steel finish for steel lattice towers, and a weathered steel (Cor-ten) finish for steel H-frame structures. To further reduce impacts in more sensitive portions of the B2H Project area and to assist with agency conformance, a number of additional mitigation measures were developed. The selective mitigation measures specifically proposed for visual resources are as follows:

- **Selective Mitigation Measure 1 (Limit Widening of Existing Roads in Areas of Sensitive Soils and Vegetation)**. In areas where soils, vegetation, and/or streams are sensitive to disturbance, existing roads to be used for construction of access and/or B2H Project maintenance would not, as much as possible/practicable, be widened or otherwise upgraded except in areas necessary to make existing roads passable and safe.
- **Selective Mitigation Measure 2 (Use Existing Access and/or Crossing for Sensitive Resources Avoidance)**. Existing access and/or stream crossings would be used as much as possible/practicable for construction and maintenance to avoid disturbance of sensitive resources crossed by the B2H Project.
- **Selective Mitigation Measure 4 (Minimize Slope Cut and Fill for Access and Work Areas)**.The alignment of new access roads would follow the landform contours where practicable to minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape. Modification to the size and/or configuration of the structure work areas facilitated by minor structure design adjustments (e.g., altering leg length) would be used to minimize cut and fill slopes and blend contours with existing topography.

  Additionally, soil amendments or mineral emulsions would be applied, or grading techniques such as slope rounding and slope scarification would be used to blend road and structure work area cuts into the landscape in areas of steep terrain where grading is necessary, in rocky areas, or where soil color would create strong landscape contrasts.

- **Selective Mitigation Measure 5 (Minimize Vegetation Clearing for Operational Clearances)**. Removal of vegetation in the right-of-way would be minimized to limit disturbance to timber resources, reduce disturbance to agricultural production, reduce visual contrast, and protect sensitive habitat, subject to structure- and conductor-clearance requirements. Trees and other vegetation would be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate

- **Selective Mitigation Measure 6 (Limit New or Improved Accessibility to Areas Previously Inaccessible)**. In areas of sensitive habitat or areas sensitive to additional public access, new or improved access in the B2H Project area would be limited.

  New or improved access would be closed or rehabilitated using the most effective and least environmentally damaging methods appropriate to that area (in consultation with the landowner

or land-managing agency). Methods for road closure or management may include installing locking gates, obstructing the path (e.g., earthen berms, boulders, redistribution of woody debris), revegetating and mulching the surface of the roadbed to make it less apparent, or restoring the road to its natural contour and vegetation.

- **Selective Mitigation Measure 7 (Tower Design Modification)**. The tower design may be modified to reduce resource impacts. Modifications include use of alternative structure type, modifying tower height, modifying tower leg lengths to accommodate varied terrain, and changing tower finish type.
- **Selective Mitigation Measure 9 (Match Transmission Spans)**. Standard tower design would be modified to correspond with spacing of existing transmission line structures of similar voltage and/or span lengths, where feasible and within limits of standard tower design, to reduce visual contrast and/or potential operational conflicts. The normal span would be modified to correspond with existing towers, but not necessarily at every location.
- **Selective Mitigation Measure 14 (Overland Access)**. In addition to using overland travel in work areas, overland access to work areas may be used to reduce resource impacts. The construction contractor would use overland access in areas where no grading would be needed to access work areas. Overland access would consist of drive-and-crush (i.e., vehicular travel to access a site without significantly modifying the landscape, cropping vegetation, or removing soil) and/or clear-and-cut travel (removal of all vegetation while leaving the root crown intact to improve or provide suitable access for equipment). Prior to commencement of work activities, overland access routes would be staked. Routes would be specified in the POD. Use of overland access routes would be restricted based on dry or frozen soil conditions, seasonal weather conditions, and relatively flat terrain.

For more information, refer to Chapter 2 under Table 2-13. Selective Mitigation Measures.

Along with following guidelines based on *Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM Lands*, in an attempt to decrease the level of impacts on key areas, these mitigations were generally applied to:

- Areas with Class A scenic quality where B2H Project contrast would be high or moderate
- Areas with Class B scenic quality where B2H Project contrast would be high
- Areas in which viewer impacts would be high or, in some cases, moderate
- Areas in proximity to Sensitive Viewing Platforms from which impacts would be high or moderate
- Areas where the analysis identified noncompliance with management objectives
- Areas about which agencies or the public have expressed particularly strong concerns

Residual Impacts

Residual impacts on visual resources were determined by applying the additional mitigation measures to lessen initial impacts from the B2H Project. The analyses presented in the Visual Resources section represent residual impacts only; for clarity, initial impacts are not included in this section.

3.2.12.5 AFFECTED ENVIRONMENT

The following section describes the existing visual resources of the study corridor. This section provides information about the general regional character in relation to ecoregions, the visual environment by county, an overview of the existing visual resources by Segment, and a comparison by Segment of pertinent BLM and USFS visual resource components for each route alternative and option. Additional detail regarding the affected environment can be found in the VAU Description Table in Appendix H.

REGIONAL LANDSCAPE CHARACTER

Visual resources traversed by the route are a result of geology, climate, and historical processes and are influenced by topographic relief, vegetation, water, wildlife, and land use. Human uses, such as industrial uses, timber, agriculture, and urban development activities, also are considered as part of the scenic resources of the study corridor. The regional landscape character of the existing visual resources within the study corridor is described below in terms of ecoregion classifications. The B2H Project spans portions of four ecoregions, including the Columbia Plateau, Blue Mountains, Northern Basin and Range, and Snake River Plain (Map 3-5). The ecoregion classifications for Oregon and Idaho were designed to fit with a comparable, hierarchical system for the U.S. published by the U.S. EPA and referred to as the North American Ecoregions Level III (EPA 2010).The general characteristics of the ecoregions within the study corridor are summarized below.

Columbia Plateau

The Columbia Plateau covers much of central and southeastern Washington, north-central Oregon, and a small portion of northwestern Idaho. The plateau consists of nearly horizontal sheets of lava built up over time, and its surface is generally flat to rolling, with some variations. It is an arid area with sagebrush steppe and grassland native vegetation communities. The region is flanked by moister, predominantly forested, mountainous ecoregions, primarily the Cascades to the west and the Blue Mountains to the south and southeast. Geologically, the Columbia Plateau is known for a deep foundation of multiple layers of volcanic basalt up to 2 miles thick. The Columbia River bisects the plateau and is the dominant water feature in the ecoregion (EPA 2010).

Blue Mountains

This region is a mountainous area located chiefly in northeastern Oregon but extending a short distance into southeastern Washington. The Blue Mountains Ecoregion includes several mountain ranges that are mostly volcanic in origin and that are lower and more open than the neighboring Cascades and Northern Rockies. The Wallowa and Elkhorn mountains are the highest of the ranges and form the core of the region. These mountains are composed of granitic intrusive, deep sea sediments and metamorphosed rocks rising 9,000 feet above sea level and 3,000 feet above the dissected plateau surface.

In the western portion of the Blue Mountains, the Mesic Forest subregion has a marine influence and has higher precipitation than other forested Blue Mountains ecoregions. The ashy soil holds moisture during the dry season and supports a productive spruce-fir forest. In addition,

these soils over basalt retain sufficient moisture to support forest cover at lower elevations than elsewhere in the Blue Mountains. A dense and diverse shrub layer grows beneath the relatively open canopy of ponderosa pine and Douglas-fir (EPA 2010).

To the east, beyond the Mesic Forest subregion, is an area that includes the Grande Ronde and Baker valleys, which receive stream flow from the surrounding Blue Mountains. The Grande Ronde Valley has a more marine-influenced climate, while the Baker Valley is in the rain shadow of the Elkhorn Mountains and is therefore drier. Much of the valley floor area in this part of the Blue Mountains is now used for agriculture. The southeastern part of the Blue Mountains region has a continental climate and experiences wide temperature variations and high evapotranspiration rates. Natural vegetation consists primarily of desert shrubs, including bitterbrush and mountain mahogany (EPA 2010).

Northern Basin and Range

A portion of the study corridor in central Malheur County is within the Northern Basin and Range Ecoregion, and from approximately Lake Owyhee eastward to Hemingway, the Proposed Action essentially is located in the transition zone between the Northern Basin and Range and Snake River Plain ecoregions. The predominant land use within this ecoregion is rangeland. The Northern Basin and Range Ecoregion contains dissected lava plains, rolling hills, alluvial fans, valleys, and scattered mountains. The area is somewhat higher and cooler than the Snake River Plain with sagebrush as the predominant natural vegetation in the basin areas. The ranges typically are covered with mountain mahogany, junipers, and pines and in the higher elevations, aspen and Douglas firs (EPA 2010).

Snake River Plain

The plains and low hills of the Snake River Plain are part of the xeric intermontane west. The Snake River Plain is considerably lower and less rugged than the adjacent ecoregions. Many of the alluvial valleys bordering the Snake River are used for agriculture and principally grow sugar beets, potatoes, alfalfa, small grains, and vegetables. Outside of the alluvial valleys, the remainder of the Snake River Plain in both Oregon and Idaho is covered by sagebrush—grassland with rolling foothills, hills, benches, and scattered badlands that are characteristically underlain by alkaline lacustrine deposits. Salt-tolerant shrubs, including black greasewood, fourwing saltbush, inland saltgrass, and shadscale, occur on alkaline outcrops. Vegetation outside of agricultural areas is dominated by Wyoming big sagebrush, basin big sagebrush, bluebunch wheatgrass, and cheatgrass. In saline areas, greasewood and saltgrass occur (EPA 2010).

Map 3-5

Ecoregions within the Visual Resources Study Corridor

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Ecoregions

- Blue Mountains
- Columbia Plateau
- Northern Basin and Range
- Snake River Plain

Project Features

- Project Area Boundary
- 5-mile Radius from Route Centerlines
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Line

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Ecoregions, EPA 2010; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10 20 30 40
Miles
1:1,393,920 or 1 inch = 22 miles

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VISUAL ENVIRONMENT

Land-use patterns within the study corridor are influenced by the distribution of land ownership. The portions of Morrow and Umatilla counties that are within the study corridor are almost exclusively under private ownership. Union County is predominantly (about 85 percent) under private ownership, while federal lands managed by the USFS comprise most of the remaining area. Baker County also is about 70 percent under private ownership, with most of the remaining area being federal lands divided between BLM and USFS management. The portions of Malheur and Owyhee counties that are within the study corridor are nearly 80 percent federal lands under BLM management with less than one percent under Reclamation.

Principal land uses within the study corridor include rangeland in shrub/grass areas, with cultivated agriculture and forestland a distant second and third, respectively. Relatively small portions of the alternative alignments cross vacant areas (including disturbed and extractive mining areas), developed areas (including commercial, residential, recreation, and existing infrastructure), and open water areas. Notable built features are summarized below by county.

Morrow County

The predominant land uses in western Morrow County are dryland and irrigated farming, as well as rangeland. Several utility uses also are present, including the Boardman Coal-fired Generating Plant with its 656-foot-high stack, existing transmission lines (e.g., the Boardman to Slatt 500-kV line), and extensive wind energy development near the small community of Cecil. The Proposed Action also passes along the western and southern boundary of the Boardman Grasslands Conservation Area, designated by Oregon and managed by The Nature Conservancy. The Proposed Action parallels the southern boundary of the Boardman Bombing Range. The Navy currently manages the Boardman Bombing Range as an active training range. Oregon owns and leases a large portion of Morrow County to the Boeing Agri-Industrial Company, whose future plans include developing the entire leased area into irrigated farmland. Boardman, which is located on the southern edge of the Columbia River, is the only incorporated city in Morrow County that falls within the study corridor. Recognized farming communities within or immediately adjacent to the study corridor include Cecil, Ella, and Alpine. Major highways within the study corridor include I-84, U.S. Highways 30 and 730, and State Highways 74 and 207.

Umatilla County

The Proposed Action crosses privately owned land in Umatilla County for approximately 49 miles. In the western part of the county, generally west of the incorporated city of Pilot Rock and U.S. Route 395, existing land use primarily consists of dryland farming. East of U.S. Route 395 and Pilot Rock, the Applicant's Proposed Action Alternative progresses through rangeland and the forested land in the foothills of the Blue Mountains near the Old Union Pacific Railroad station at Meacham in the eastern portion of the county. In addition to the unincorporated rural communities of Vinson, McKay, and Sparks, there are a number of scattered residences, cabins, and recreation facilities located within the

study corridor. The transportation network within the study corridor in Umatilla County includes I-84, U.S. Highways 395 and 30, and Highway 74.

Union County

Predominant land uses within Union County include irrigated agriculture and dryland farming, ranchland, and forested lands. The Wallowa-Whitman National Forest lands support a wide range of recreation activities and numerous developed recreation facilities. Most of the Wallowa-Whitman National Forest portion is within a designated utility corridor, where the Proposed Action also is parallel to I-84, a railway, a 230-kV electric transmission line, a petroleum products pipeline, and two large natural gas pipelines. In addition to I-84 and U.S. Highway 30, State Highways 12, 203, and 244 form the major transportation network within Union County. The Blue Mountain Scenic Byway and Hilgard Junction State Park also are located in this portion of the study corridor within Union County. In the central portion of the county, an extensive area of developed land uses in and near the City of La Grande is located to the east and north of the Proposed Action. Unincorporated communities within the study corridor in Union County include Hilgard, Kamel, Medical Springs, Perry, Pondosa, and Teleocaset.

In the southern portion of the county, the Proposed Action generally runs parallel to an existing Idaho Power Company 230-kV line crossing mostly rangeland to the Union County/Baker County line. The city of North Powder is located on the Powder River near the county line within the study corridor. There are a number of center pivot irrigation systems and farms in this portion of the county but not any substantial areas of more intensive development other than North Powder. The Elkhorn Valley Wind Farm is located near the Proposed Action in the southern portion of Union County.

Baker County

The study corridor within Baker County includes several areas where intensive agricultural use occurs. Land use in the county is dominated by agriculture, rangeland, and forested areas. Baker and Durkee valleys, located north and south of Baker City, respectively, are both intensively farmed areas in the county. Baker City is the county seat and the largest city within the county. Huntington, Haines, and Richland are three other incorporated municipalities within the study corridor in Baker County. The unincorporated communities within the study corridor in Baker County include Dixie, Durkee, Lime, New Bridge, Pleasant Valley, and Weatherby. In addition to I-84 and U.S. Highway 30, State Highways 7, 86, and 203 form the major transportation network within Baker County. Near Huntington, in the southeastern corner of Baker County, the Proposed Action leaves the general I-84 corridor and proceeds southwest through an area of steep topography and rangeland to the Baker/Malheur County line.

Proposed alternative alignments within this area are spread widely across the landscape. These lands vary greatly in ownership/management and use, and range from Wallowa-Whitman National Forest lands that are primarily forested (with some rangeland), to private and BLM-administered lands that primarily consist of rangeland and occasional dry or irrigated agricultural lands.

Malheur County

Although most of the land use within the study corridor in Malheur County is rangeland with little or no development, typical rural land uses, such as single-family residences and farmland, also occur in a scattered pattern. Vale is the county seat, and Ontario is the largest city within the county. Adrian is the only incorporated municipality within the study corridor in Malheur County. The unincorporated communities within the study corridor in Malheur County include Brogan, Owyhee, and Willow Creek.

There also are several areas of mining use or gravel pits. The study corridor includes several infrastructure facilities, including I-84, U.S. Highways 20, 26, and 30, State Highway 201, the Union Pacific Railroad, and several existing transmission lines of varying size.

Southwest of the community of Adrian, the Proposed Action passes near the entrance of the Owyhee River Canyon. Other lands within the canyon are managed by Reclamation as part of the Owyhee Irrigation Project, completed in 1939 to furnish irrigation water to more than 105,000 acres of land in southeastern Oregon and southwestern Idaho. The irrigation project included Owyhee Dam and Reservoir, a long, narrow reservoir with about 150 miles of shoreline that experiences heavy recreational use. Upstream of the reservoir, the Owyhee River is designated as a WSR, and the Owyhee Dam is listed on the NRHP. The BLM, Reclamation, Oregon, the county, and other agencies cooperatively manage and protect the resource values and recreation opportunities within the river canyon.

Owyhee County

The vast majority of land use within the study corridor is a mixture of rangeland, former mining and gravel pit operations, and irrigated agricultural fields. The largest community within the study corridor is Givens Hot Springs, located along the Snake River. Homedale and Marsing are Owyhee County cities that are just outside of the study corridor. The land surrounding the Hemingway Substation is mostly agricultural, with some single-family residential development present. Some areas with special land-managing designations are located in the vicinity of the Proposed Action in Owyhee County. These include BLM designations for the Jump Creek Canyon ACEC/SRMA, the Squaw Creek ACEC and Research Natural Area, and the Wilson Creek and Hemingway Butte recreation sites. The major transportation network within the study corridor includes U.S. Highway 95 and State Highways 19 and 78.

OVERVIEW OF EXISTING VISUAL RESOURCES BY SEGMENT

- 7 of scenic quality C (BA-001 Columbia River Valley, BA-003 Longhorn, BA-004 Butter Creek, BA-005 Matlock, BA-006 Coombs, BA-007 McKay, and BA-008 Spring Hollow)
- 4 of scenic quality B (BA-009 Blue Mountains Rocky Ridge, BA-011 Blue Mountains Forest, BA-031 Umatilla River, and BR-001 Columbia River Valley)
- 1 of scenic quality A (BA-018 Grand Ronde River)

Segment 1—Morrow-Umatilla

Segment 1 is located in Morrow, Umatilla, and Union counties in Oregon. Most of the northern portion of Segment 1 is located through relatively flat agricultural lands and on the southern end crosses through portions of steep, rolling flat-topped Blue Mountains. Vegetation in these portions of the Blue Mountains is composed of moderately dense evergreen forest with random open pockets of sage steppe. The study area includes portions of the McKay Creek and the Umatilla River and existing development includes rural development and large transmission lines. This area is dominated by Class C landscapes. There are also a number of viewers within Segment 1, including identified Sensitive Viewing Platforms, residences, and incorporated communities such as Boardman, Houghton, Hermiston, Stanfield, Echo, Pilot Rock, and Pendleton, Oregon. Sensitive Viewing Platforms within this segment include platforms related to recreation, residences, and general travel routes. These platforms are as follows (additional details related to each VAU can be found in the VAU table in Appendix H):

- 6 related to Recreation (2-16 Lindsay Prairie Preserve, 2-17 Boardman Research Natural Area – Bombing Range Road, 2-18 Boardman Conservation Area- Tower Road south, 3-3 Blue Mountain State Scenic Corridor, 3-20 McKay Creek NWR – Boat Launch, and 3-21 McKay Creek NWR – Spring Creek Road)
- 3 related to Residences (2-20 Butter Creek Junction, 2-23 Wilson Lane Southeast, and 3-12 Pilot Rock Community)
- 6 related to Travel Routes (Interstate 82, Interstate 84, State Highway 244, State Highway 74, State Highway 207, and U.S. Highway 395)

Segment 2—Blue Mountains

Segment 2 is located within Union and Baker counties in Oregon, and is located entirely within the Blue Mountains Ecoregion. The northwestern portion of this Segment is located within the steep, rolling, flat-topped Blue Mountains, and the study area extends south and east through the mountains and across the Grand Ronde River. Vegetation within these portions of the Blue Mountains is composed of moderately dense evergreen forest with random open pockets of sage steppe. To the South of La Grande, Oregon, the study area continues to extend to the southeast, descending out of the Blue Mountains into rolling sage steppe hills and flat agricultural valleys to a point near Thief Valley Reservoir. Existing development within the area includes 230-kV transmission lines, a small wind farm near Thief Valley Reservoir, rural agriculture and ranching development, and urban development associated with nearby communities. Segment 2 is dominated by B quality landscapes, followed by a lesser amount of C quality landscapes, and a small amount of scenic quality A landscapes. The scenic quality ratings of the VAUs are as follows (additional details related to each VAU can be found in the VAU table within Appendix H):

- 2 of scenic quality C (BA-012 Grand Ronde Valley and BA-015 Baker Valley)
- 4 of scenic quality B (BA-011 Blue Mountains Forest, BA-013 Wallowa Mountains, BA-014 Blue and Wallowa Foothills, and BA-016 Pyles Canyon and Thief Valley)
- 1 of scenic quality A (BA-018 Grand Ronde River)

There are also a number of viewers within Segment 2, including identified Sensitive Viewing Platforms, residences, and incorporated communities such as La Grande and North Powder. Sensitive Viewing Platforms within this Segment include platforms related to recreation, residences, and general travel routes. These platforms are as follows:

- 11 related to Recreation (3-24 Meacham Divide Nordic Skiing Area, 4-3 Bird Track Springs USFS Campground, 4-4 Blue Mountain Crossing Sno-Park, 4-5 Blue Mountain Forest State Scenic Corridor - Old Emigrant Hill Scenic Frontage Rd, 4-6 Blue Mountain Forest State Scenic Corridor - Summit Rd (Exit 243), 4-17 Grande Tour Oregon Tour Route – Thief Valley Reservoir, 4-19 Hilgard Junction State Park, 4-26 Ladd Marsh Wildlife Area – Foothill Road 4-28 Morgan Lake Park, 4-33 Blue Mountain Forest Double Parking Lot, 4-40 Spring Creek USFS Campground)
- 4 related to Residences (3-40 Community of Echo, 3-41 City of Pendleton, 4-51 La Grande, and 4-55 Elk Song Ranch)
- 3 related to Travel Routes (Interstate 84, State Highway 203, and State Highway 244)

Segment 3—Baker Valley

Segment 3 is located within Union and Baker counties in Oregon, and is located entirely within the Blue Mountains Ecoregion. This Segment begins near Thief Valley Reservoir, and includes a broad area that varies in character from east to west. The eastern portion of this Segment rises in elevation from Thief Valley Reservoir through sage steppe hills into the densely forested incised drainages and steeply rolling Wallowa Mountains. To the south, the character of the eastern portion of the Segment transitions back to steeply rolling sage steppe hills with occasional flat agricultural valleys. Existing development in the eastern portion of Segment 3 is limited, but includes a small wind farm near Thief Valley Reservoir, a 230-kV transmission line crossing to the north of Eagle Valley, and rural development associated with Eagle Valley. The western portion of the Segment is dominated by softly rolling hills, steeply rolling mountains, and incised drainages that are generally covered by sage steppe vegetation. Flat agricultural valleys are also present within this area. Existing development within the western portion of this Segment include 69-kV, 138-kV, and 230-kV transmission lines, as well as rural development, and urban development associated with nearby communities. This segment is dominated by both C and B quality landscapes, along with a small amount of scenic quality A landscapes. The scenic quality ratings of the VAUs are as follows (additional details related to each VAU can be found in the VAU table within Appendix H):

- 6 of scenic quality C (BA-015 Baker Valley, BA-019 Lower Powder Valley, BA-021 Virtue Flat, BA-024 Sutton Creek, BA-026 Durkee Creek, and BA-027 Caribou Bar)
- 6 of scenic quality B (BA-013 Wallowa Mountains, BA-014 Blue and Wallowa Foothills, BA-016 Pyles Canyon and Thief Valley, BA-025 Juniper and Sugarloaf Mountains, BA-022 Eagle Valley, and BA-023 Eagle Valley Foothills)
- 1 of scenic quality A (BA-010 Eagle Creek)

There are also a number of viewers within Segment 3, including identified Sensitive Viewing Platforms, residences, and incorporated communities such as North Powder, Baker City, and Richland, Oregon. Sensitive Viewing Platforms within this Segment include platforms related to recreation, residences, and general travel routes. These platforms are as follows:

- 4 related to Recreation (5-34 Powder River ACEC, 5-81 Burnt River, and 5-84 Virtue Flat OHV Area)
- 2 related to Residences (4-10 North Powder Community and 5-82 Durkee Community)
- 7 related to Travel Routes (Interstate 84, State Highway 203, Alder Creek Road, Daly Creek Road, Eagle Creek Road, Manning Creek Road, and Sparta Road)

Segment 4—Brogan

Segment 4 is located in the central portion of the study area, within Baker and Malheur counties in Oregon. This Segment is located along the transition from the Blue Mountain ecoregion to the Snake River Plain ecoregion. The Snake River is located within the northeastern portion of the Segment, bordered to the east by steeply rolling sage steppe mountains and to the west by moderately to steeply rolling sage steppe hills. To the south and west of the River, flat agricultural valleys dissect the rolling hills. Existing development within Segment 4 includes 69-kV and 138-kV transmission lines, as well as rural agricultural development within the flat valley bottoms. This segment is dominated by C quality landscapes, followed by a lesser amount of B quality landscapes, and no scenic quality A landscapes. The scenic quality ratings of the VAUs are as follows (additional details related to each VAU can be found in the VAU table within Appendix H):

- 10 of scenic quality C (BA-027 Caribou Bar, BA-031 Phipps Creek, MA-007 Cow Valley Butte, MA-009 Becker Creek, MA-012 Gum Creek, MA-013 Thorn Flat, MA-015 Juniper Mountain, MA-038 Hope Butte, MA-040 Moores Hollow, and MA-120 Alkali Flats)
- 5 of scenic quality B (BA-025 Juniper and Sugarloaf Mountains, BA-028 Brownlee Reservoir, MA-011 Crow Creek, MA-039 Treasure Valley, and MA-119 Danger Point)

There are also a number of viewers within Segment 4, including identified Sensitive Viewing Platforms, residences, and the incorporated communities of Huntington, Oregon. Sensitive Viewing Platforms within this Segment include platforms related to recreation, residences, and general travel routes. These platforms are as follows:

- 6 related to Recreation (5-13 Farewell Bend State Recreation Area, 5-59 Microwave Spring, 7-1 Weiser Dunes OHV Area, 7-6 Steck Park BLM Recreation Site. 8-5 Bully Creek Reservoir, and 8-34 South Alkali Sand Hills ACEC)
- 2 related to Residences (8-6 Brogan Community and 8-8 Jamieson Community)
- 2 related to Travel Routes (Interstate 84 and US Highway 26)

Segment 5—Malheur

Segment 5 is located entirely within Malheur County, Oregon, and is located within the Snake River Plain and Northern Basin and Range ecoregions. This Segment is characterized by moderately to steeply rolling sage steppe hills with intersecting flat agricultural valleys and incised river and creek canyons associated with Bully Creek, the Malheur River, and the Owyhee River. These canyons are generally characterized by basalt rock outcroppings and cliffs that contrast with smooth slopes covered with dense and evenly textured sage steppe vegetation. Existing development within Segment 5 is limited within the expanses of rolling sage steppe hills. Development is generally clustered within the flat valley bottoms, primarily consisting of rural agricultural development. One 69-kV transmission line and one 115-kV transmission line are located within the Segment, as well as a 500-kV transmission line that generally extends from east to west and crosses the Owyhee River Canyon. This segment is dominated by B and C quality landscapes, but also includes several scenic quality A landscapes. The scenic quality ratings of the VAUs are as follows (additional details related to each VAU can be found in the VAU table within Appendix H):

- 9 of scenic quality C (MA-012 Gum Creek, MA-015 Juniper Mountain, MA-038 Hope Butte, MA-041 Sourdough Basin, MA-058 Hoodoo Ridge, MA-074 Board Coral, MA-075 North Alkali, MA-077 Antelope Springs, OW-001 Owyhee Mountains)
- 7 of scenic quality B (MA-039 Treasure Valley, MA-044 Westfall/Harper Valley, MA-060 Owyhee Tunnel, MA-119 Danger Point, MA-121 Big sage Flat, OW-019 Treasure Valley, and MA-059 Grassy Mountain)
- 3 of scenic quality A (MA-073 Iron Mountain, MA-078 Succor Creek and MA-122 Owyhee River)

There are also a number of viewers within Segment 5, including identified Sensitive Viewing Platforms, several residences, and the incorporated community of Adrian, Oregon. Sensitive Viewing Platforms within this Segment include platforms related to recreation, residences, and general travel routes. These platforms are as follows:

- 13 related to Recreation (8-51 Big Bend Access Site, 8-52 Lower Owyhee Interpretive Site, 8-74 McIntyre Ridge– Succor Creek Road, 8-75 Antelope Creek, 8-84 Burnt Mountain (Old Mormon Hand Cart Trail), 8-85 Sourdough Mountain– Twin Springs Road, 8-88 Broken Rim– Hoo Doo Road North, 8-90 Double Mountain– Rock Canyon Road, 8-91 Double Mountain– Twin Springs Road, 8-93 Double Mountain– Negro Rock Creek Middle, 8-94 Double Mountain– Negro Rock Creek South, 8-95 Lower Owyhee River Site H2, and 8-96 Lower Owyhee River Site H1)
- 1 related to Residences (8-102 Succor Creek Rural Area)
- 2 related to Travel Routes (US Highway 20, and Mitchell Butte Road)

Segment 6—Treasure Valley

Segment 6 is located at the southern extent of the study area, within Malheur County, Oregon and Owyhee County in Idaho. This Segment is located along the transition between the Snake River Plain and Northern Basin and Range ecoregions. The Snake River runs along the length of the northeastern portion of the Segment, within a flat to moderately rolling agricultural valley. The southeastern portion of

the Segment is characterized by steeply rolling sage steppe hills and mountains of the Owyhee Mountain formation. This area is intersected by a number of incised canyons associated with Succor Creek, Sage Creek, Poison Creek, Jump Creek, Squaw Creek, Hardtrigger Creek, and Reynolds Creek. These canyons are generally characterized by basalt rock outcroppings and cliffs that contrast with smooth slopes covered with dense and evenly textured sage steppe vegetation. Existing development within Segment 6 is limited within the expanses of rolling sage steppe hills. Development is generally clustered within the flat to rolling valley bottom and primarily consists of rural agricultural development. Several 69-kV and 230-kV transmission lines are located within the Segment, as well as a 500-kV transmission line that runs along the edge of the agricultural valley at the base of the Owyhee Mountains. This segment is dominated by C quality landscapes, followed by a slightly lesser amount of B quality landscapes, and several scenic quality A landscapes. The scenic quality ratings of the VAUs are as follows (additional details related to each VAU can be found in the VAU Description Table in Appendix H):

- 5 of scenic quality C (MA-074 Board Coral, MA-077 Antelope Springs, OW-001 Owyhee Mountains, OW-005 Squaw Creek, and OW-006 Willow Spring)
- 5 of scenic quality B (MA-039 Treasure Valley, MA-060 Owyhee Tunnel, MA-075 North Alkali, OW-008 Reynolds Creek, and OW-019 Treasure Valley)
- 3 of scenic quality A (MA-078 Succor Creek, OW-007 Salmon Butte, and OW-020 Jump Creek)

There are also a number of viewers within Segment 6, including identified Sensitive Viewing Platforms, and several residences. Sensitive Viewing Platforms within this Segment include platforms related to recreation, residences, and general travel routes. These platforms are as follows:

- 12 related to Recreation (10-12 Trappers Flat Snake River Access Site, 10-17 Snake River Overlook - Pump Road, 10-19 Map Rock Snake River Access Site, 12-4 Givens Hot Springs Campground, 12-5 Hemingway Butte OHV Recreation Area, 12-8 Jump Creek Canyon ACEC, 12-17 Squaw Creek Canyon Entrance, 12-18 Squaw Creek Research Natural Area, 12-21 Wilson Creek Trailhead, 12-22 Wilson Creek Wayside, and 12-23 Eastern Terminus - Wilson Cemeter)
- 3 related to Residences (12-13 China Ditch Road Rural Residential Area, 12-27 Poison Creek Rural Area, and 12-28 Jump Creek Rural Area)

There are no travel routes associated with Segment 6.

VISUAL RESOURCE INVENTORY AND MANAGEMENT COMPONENTS BY SEGMENT

The following tables (Table 3-404 through Table 3-412) provide a comparison of the amount of pertinent BLM and USFS visual inventory and visual management components crossed by the Project. The tables are organized by Segment and include each alternative and option within the segments, respectively. Note that there are no USFS lands crossed within Segments 4 to 6 and, therefore, there are no associated tables representing these segments.

Table 3-404. Visual Resource Inventory and Management Components by the Bureau of Land Management Field Office for Segment 1—Morrow-Umatilla (miles crossed)

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office			Visual Resource Management Class			Scenic Quality Class			Sensitivity Level		
		Baker (Oregon)	Malheur (Oregon)	Owyhee (Idaho)	II	III	IV	A	B	C	High	Moderate	Low
Applicant's Proposed Action	91.9	91.9	0.0	0.0	0.0	0.0	0.2	0.0	0.0	91.9	9.2	82.7	0.0
Variation S1-B1	*6.4*	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*6.4*	*5.4*	*1.0*	*0.0*
Variation S1-B2	*6.4*	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*6.4*	*6.0*	*0.4*	*0.0*
East of Bombing Range Road	92.3	92.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	92.2	9.2	83.0	0.0
Applicant's Proposed Action – Southern Route	99.1	99.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	99.1	9.2	89.9	0.0
West of Bombing Range Road – Southern Route	95.6	95.6	0.0	0.0	0.0	0.0	0.3	0.0	0.0	95.6	8.5	87.1	0.0
Longhorn	88.2	88.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	88.2	15.3	73.1	0.0
Interstate 84	84.7	84.7	0.0	0.0	0.0	0.0	0.2	0.0	0.0	84.7	25.2	59.5	0.0
Variation S1-A1	*18.5*	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*
Variation S1-A2	*18.5*	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*0.0*	*18.5*	*0.0*	*18.5*	*0.0*
Interstate 84 – Southern Route	93.4	93.4	0.0	0.0	0.0	0.0	0.3	0.0	0.0	93.4	25.2	68.2	0.0

Table 3-405. Visual Resource Inventory and Management Components by Bureau of Land Management Field Office for Segment 2—Blue Mountains (miles crossed)

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office			Visual Resource Management Class			Scenic Quality Class			Sensitivity Level		
		Baker (Oregon)	Malheur (Oregon)	Owyhee (Idaho)	II	III	IV	A	B	C	High	Moderate	Low
Applicant's Proposed Action	33.8	33.6	0.0	0.0	0.0	0.0	0.8	0.0	15.1	18.5	16.8	16.8	0.0
Variation S2-A1	*2.8*	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*
Variation S2-A2	*2.9*	*2.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.9*	*0.0*	*2.9*	*0.0*
Variation S2-B1	*3.7*	*3.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.8*	*0.0*	*0.0*	*3.6*	*1.4*	*2.2*	*0.0*
Variation S2-B2	*3.8*	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.8*	*1.0*	*2.8*	*0.0*
Variation S2-C1	*9.3*	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*9.2*	*0.1*	*9.2*	*0.0*
Variation S2-C2	*8.8*	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*8.8*	*0.0*	*8.8*	*0.0*
Variation S2-E1	*2.3*	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.3*	*0.0*	*2.3*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.6*	*0.0*	*2.6*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*12.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*12.1*	*0.0*	*12.1*	*0.0*	*0.0*
Variation S2-F2	*12.2*	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*0.0*
Glass Hill	33.7	33.6	0.0	0.0	0.0	0.0	0.5	0.0	15.1	18.5	17.4	16.1	0.0
Variation S2-D1	*4.3*	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.3*	*0.0*	*4.3*	*0.0*
Variation S2-D2	*4.1*	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.1*	*0.0*	*4.1*	*0.0*
Mill Creek	34.0	34.0	0.0	0.0	0.0	0.0	0.0	0.0	14.2	19.9	15.7	18.3	0.0

Table 3-406. Visual Resource Inventory and Management Components by Bureau of Land Management Field Office for Segment 3—Baker Valley (miles crossed)

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office			Visual Resource Management Class			Scenic Quality Class			Sensitivity Level		
		Baker (Oregon)	Malheur (Oregon)	Owyhee (Idaho)	II	III	IV	A	B	C	High	Moderate	Low
Applicant's Proposed Action	55.2	55.0	0.0	0.0	0.0	0.0	12.3	0.0	27.0	28.0	55.0	0.0	0.0
Variation S3-A1	*12.4*	*12.3*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*0.0*	*12.3*	*0.0*	*12.3*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*12.2*	*0.0*	*12.2*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*13.9*	*0.0*	*0.0*	*0.0*	*1.3*	*4.1*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*14.4*	*0.0*	*14.4*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*14.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*14.7*	*0.0*	*14.8*	*0.0*	*0.0*
Variation S3-B4	*14.3*	*14.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*14.2*	*0.0*	*14.2*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*0.0*	*13.9*	*0.0*	*13.9*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*21.1*	*0.0*	*0.0*	*0.0*	*5.2*	*6.1*	*0.0*	*0.0*	*21.1*	*21.1*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*21.7*	*0.0*	*0.0*	*0.0*	*3.9*	*4.5*	*0.0*	*0.0*	*21.7*	*21.7*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*21.1*	*0.0*	*0.0*	*0.0*	*0.9*	*5.3*	*0.0*	*4.6*	*16.5*	*21.0*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*21.3*	*0.0*	*0.0*	*0.7*	*0.0*	*5.1*	*0.0*	*4.8*	*16.5*	*21.3*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*21.0*	*0.0*	*0.0*	*1.3*	*0.0*	*5.8*	*0.0*	*6.7*	*14.3*	*21.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*24.7*	*0.0*	*0.0*	*2.8*	*0.0*	*6.2*	*0.0*	*6.0*	*18.8*	*24.7*	*0.0*	*0.0*
Flagstaff A	55.3	55.0	0.0	0.0	0.0	1.3	8.3	0.0	27.0	28.0	55.0	0.0	0.0
Timber Canyon	70.3	70.2	0.0	0.0	5.0	0.2	3.1	0.0	43.4	26.8	59.8	0.0	0.0
Flagstaff A – Burnt River Mountain	55.3	54.9	0.0	0.0	0.0	0.9	17.3	0.0	31.5	23.4	54.9	10.4	0.0
Flagstaff B	56.0	55.9	0.0	0.0	0.0	1.3	8.1	0.0	27.9	28.0	55.9	0.0	0.0
Flagstaff B – Burnt River West	55.7	55.7	0.0	0.0	1.3	0.0	6.9	0.0	34.4	21.2	55.7	0.0	0.0
Flagstaff B – Durkee	59.6	59.6	0.0	0.0	2.8	0.0	8.1	0.0	33.9	25.7	59.6	0.0	0.0

Table 3-407. Visual Resource Inventory and Management Components by Bureau of Land Management Field Office for Segment 4—Brogan (miles crossed)

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office			Visual Resource Management Class			Scenic Quality Class			Sensitivity Level		
		Baker (Oregon)	Malheur (Oregon)	Owyhee (Idaho)	II	III	IV	A	B	C	High	Moderate	Low
Applicant's Proposed Action	40.1	12.9	27.4	0.0	0.0	0.0	20.1	0.0	0.5	39.8	9.2	18.2	12.9
Variation S4-A1	*5.9*	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.0*	*0.0*	*5.9*	*5.9*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.0*	*0.0*	*5.9*	*5.9*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.8*	*0.0*	*0.0*	*6.0*	*6.0*	*0.0*	*0.0*
Tub Mountain South	40.5	11.5	29.0	0.0	0.0	7.1	18.7	0.0	3.8	36.7	8.1	17.4	14.9
Willow Creek	34.6	11.8	22.9	0.0	0.0	0.8	14.3	0.0	3.0	31.7	8.3	11.5	14.9

Table 3-408. Visual Resource Inventory and Management Components by Bureau of Land Management Field Office for Segment 5—Malheur (miles crossed)

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office			Visual Resource Management Class			Scenic Quality Class			Sensitivity Level		
		Baker (Oregon)	Malheur (Oregon)	Owyhee (Idaho)	II	III	IV	A	B	C	High	Moderate	Low
Applicant's Proposed Action	40.4	0.0	40.4	0.0	1.5	4.6	24.1	0.0	10.1	30.3	0.8	30.1	9.5
Variation S5-A1	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*	*0.0*	*1.1*	*0.0*	*0.0*	*7.4*	*0.0*	*6.3*	*1.1*
Variation S5-A2	*7.4*	*0.0*	*7.4*	*0.0*	*0.0*	*0.0*	*7.3*	*0.0*	*0.0*	*7.4*	*0.0*	*6.5*	*0.9*
Variation S5-B1	*2.5*	*0.0*	*2.5*	*0.0*	*1.1*	*0.2*	*0.8*	*0.0*	*2.6*	*0.0*	*0.5*	*2.1*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*2.8*	*0.0*	*0.1*	*0.5*	*0.0*	*0.0*	*2.8*	*0.0*	*0.2*	*2.5*	*0.0*
Malheur S	43.5	0.0	43.5	0.0	1.8	4.1	33.1	1.6	10.7	31.2	4.5	34.9	4.1
Malheur A	43.1	0.0	43.1	0.0	2.3	4.1	31.4	2.0	9.4	31.7	4.5	34.4	4.1

Table 3-409. Visual Resource Inventory and Management Components by Bureau of Land Management Field Office for Segment 6—Treasure Valley (miles crossed)

Alternative Route	Total Length (miles)	Bureau of Land Management Field Office			Visual Resource Management Class			Scenic Quality Class			Sensitivity Level		
		Baker (Oregon)	Malheur (Oregon)	Owyhee (Idaho)	II	III	IV	A	B	C	High	Moderate	Low
Applicant's Proposed Action	28.0	0.0	4.1	23.8	0.0	3.0	18.3	0.5	0.5	26.9	0.0	21.4	6.6
Variation S6-A1	*9.3*	*0.0*	*2.6*	*6.7*	*0.0*	*1.3*	*6.8*	*0.0*	*0.0*	*9.3*	*0.0*	*9.3*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*2.2*	*6.7*	*0.0*	*0.2*	*5.6*	*0.0*	*0.0*	*8.9*	*0.0*	*8.9*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*0.0*	*14.4*	*0.0*	*1.6*	*8.9*	*0.0*	*0.1*	*14.3*	*0.0*	*7.8*	*6.6*
Variation S6-B2	*14.1*	*0.0*	*0.0*	*14.1*	*0.0*	*2.1*	*8.1*	*0.2*	*0.0*	*13.9*	*0.2*	*9.3*	*4.6*

Table 3-410. Visual Resource Inventory and Management Components in the Wallowa-Whitman National Forest for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Wallowa-Whitman National Forest	Visual Quality Objective				Variety Class			Level of Sensitivity		
			Retention	Partial Retention	Modification	Maximum Modification	A	B	C	1	2	3
Applicant's Proposed Action	91.9	4.4	0.4	3.6	0.4	0.0	0.0	0.4	0.0	3.5	0.5	0.4
Variation S1-B1	*6.4*	*4.4*	*0.4*	*3.6*	*0.4*	*0.0*	*0.0*	*0.4*	*0.0*	*3.5*	*0.5*	*0.4*
Variation S1-B2	*6.4*	*0.0*	*3.6*	*<0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.5*	*<0.1*	*0.0*
East of Bombing Range Road	92.3	4.4	0.4	3.6	0.4	0.0	0.0	0.4	0.0	3.5	0.5	0.4
Applicant's Proposed Action – Southern Route	99.1	4.4	0.4	3.6	0.4	0.0	0.0	0.4	0.0	3.5	0.5	0.4
West of Bombing Range Road – Southern Route	95.6	4.4	0.4	3.6	0.4	0.0	0.0	0.4	0.0	3.5	0.5	0.4
Longhorn	88.2	4.4	0.4	3.6	0.4	0.0	0.0	0.4	0.0	3.5	0.5	0.4
Interstate 84	84.7	4.4	0.4	3.6	0.4	0.0	0.0	0.4	0.0	3.5	0.5	0.4
Variation S1-A1	*18.5*	*4.4*	*0.4*	*3.6*	*0.4*	*0.0*	*0.0*	*0.4*	*0.0*	*3.5*	*0.5*	*0.4*
Variation S1-A2	*18.5*	*4.4*	*0.4*	*3.6*	*0.4*	*0.0*	*0.0*	*0.4*	*0.0*	*3.5*	*0.5*	*0.4*
Interstate 84 – Southern Route	93.4	4.4	0.4	3.6	0.4	0.0	0.0	0.4	0.0	3.5	0.5	0.4

Table 3-411. Visual Resource Inventory and Management Components in the Wallowa-Whitman National Forest for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Wallowa-Whitman National Forest	Visual Quality Objective				Variety Class			Level of Sensitivity		
			Retention	Partial Retention	Modification	Maximum Modification	A	B	C	1	2	3
Applicant's Proposed Action	33.8	1.3	0.7	0.6	0.0	0.0	0.0	0.0	0.0	1.3	<0.1	0.0
Variation S2-A1	*2.8*	*1.3*	*0.7*	*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.3*	*<0.1*	*0.0*
Variation S2-A2	*2.9*	*2.6*	*0.0*	*2.3*	*0.3*	*0.0*	*0.0*	*0.3*	*0.0*	*2.2*	*<0.1*	*0.3*
Variation S2-B1	*3.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-B2	*3.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-E2	*2.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-F1	*12.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-F2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Glass Hill	33.7	1.3	0.7	0.6	0.0	0.0	0.0	0.0	0.0	1.3	<0.1	0.0
Variation S2-D1	*4.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Mill Creek	34.0	2.6	0.0	2.3	0.3	0.0	0.0	0.3	0.0	2.3	<0.1	0.3

Table 3-412. Visual Resource Inventory and Management Components in the Wallowa-Whitman National Forest for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Wallowa-Whitman National Forest	Visual Quality Objective				Variety Class			Level of Sensitivity		
			Retention	Partial Retention	Modification	Maximum Modification	A	B	C	1	2	3
Applicant's Proposed Action	55.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*

Table 3-412. Visual Resource Inventory and Management Components in the Wallowa-Whitman National Forest for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Wallowa-Whitman National Forest	Visual Quality Objective				Variety Class			Level of Sensitivity		
			Retention	Partial Retention	Modification	Maximum Modification	A	B	C	1	2	3
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Flagstaff A	55.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Timber Canyon	70.3	22.2	0.4	3.5	14.1	4.2	0.0	16.6	0.4	2.5	2.7	17.0
Flagstaff A – Burnt River Mountain	55.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flagstaff B	56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flagstaff B – Burnt River West	55.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flagstaff B – Durkee	59.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3.2.12.6 Environmental Consequences (Results of Analysis)

Types of Potential Effects

Potential effects on visual resources are described in terms of impacts on landscape character/scenic quality, stationary viewing platforms, linear viewing platforms, and SMAs. Each of these effect types are further described below.

Landscape Character and Scenic Quality

The existing landscape within the study corridor is considered to have inherent characteristics, or landscape character, as well as varying degrees of scenic quality. Landscape character is defined as the physical characteristics of the landscape, while scenic quality is an evaluation or rating that reflects the scenic value of the landscape based on its physical characteristics. The B2H Project could have potential effects on the landscape character as a resource, and these effects also could affect the scenic quality and rating of the landscapes within the study corridor.

The existing landscape character was described for the study corridor by delineating VAUs (MV-22). Where available, these project-level units were based on the BLM VRI SQRUs, taking into account USFS landscape character units to the degree possible for USFS lands. With the exception of the area within the Baker Field Office, VAUs were delineated using the existing SQRU delineations from the BLM VRI completed in 2013 for the Owyhee and Malheur Field Offices. For the Baker Field Office, the VAUs were delineated using the same approach that was used for the Owyhee and Malheur Field

Offices but do not follow the numbering system specific to the Baker Field Office VRI. The VAU/SQRU delineations are based on areas with common landform patterns and features, vegetation communities and patterns, built features, land-use patterns, scarcity, and/or surface-water resources.

The VAUs, as described in the VAU Description Table in Appendix H, define the existing visual character and condition of the study corridor. Each VAU includes a unique identifier that includes two letters and three numbers. The letters refer to the BLM field office in which the unit lies, while the numbers correspond to the BLM VRI SQRU numbers (except for the Baker Field Office as noted above). The VAUs are grouped by BLM field office and are listed in numerical order within each field office. The descriptions are separated into landform and vegetation elements and include additional information regarding the general degree of enclosure, views, land use, ownership, cultural modifications, adjacent scenery, scarcity, VRI sensitivity level, and associated Sensitive Viewing Platforms or Sensitive Viewing Platforms for reference. This information was compiled for review of the distinct elements and to provide for consistent evaluation of the landscape in the impact assessment process.

The scenic quality of the study corridor for all lands, regardless of jurisdiction or ownership, was derived either from existing BLM VRI SQRU data, or during fieldwork efforts directly related to the B2H Project. Each SQRU/VAU received a rating that relates to its inherent aesthetic value, which is based on the key factors of land form, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The relative scenic quality (A, B, or C) is assigned to a landscape by rating the scenic quality evaluation of these key factors, based on a numerical scale. Landscapes considered to have the highest scenic value have a scenic quality rating of A; those with a rating of C are considered to be more common, less distinct landscapes (BLM 1986b).

Sensitive Viewing Platforms

The B2H Project also could affect the public's views from sensitive locations, or viewing platforms, within the study corridor. The visual sensitivity associated with these platforms reflect the public's attitude and perception regarding the landscape and, in general, the public's level of sensitivity for noticeable change to the landscape. The concept of visual sensitivity recognizes specific places, areas, and features that have visual importance relative to one's home, social, business, and recreational environment. Sensitive Viewing Platforms represent viewing locations (Sensitive Viewing Platforms) where the public would view the B2H Project both from a stationary location (e.g., scenic overlook or residential area) and a linear (e.g., scenic byway or trail) location.

Table 3-413 provides the list of stationary viewing platforms by name and number and includes the associated VAU number and name. The stationary viewing platform numbers consist of two numbers, separated by a dash. Although the numbering convention is not particularly important to the reader, the first number generally refers to the county in which the point is located, and the second number is simply an individual identification number. The second number is not always consecutive, as many viewing platforms are considered early in the process but only important platforms become part of the final analysis. In general, the stationary viewing platforms were identified through review of federal,

state, and local land-use and resource plans; land-use data available in GIS format; protected areas identified by Oregon; the federal and state public scoping process performed for the B2H Project; parks and recreation areas; presence of residential and developed areas; identification of U.S. and state highways; and consultation with federal, state, and county agencies and organizations (Tetra Tech 2012). These Sensitive Viewing Platforms, also known as KOPs, as stated in the BLM Manual 8431 – Visual Resource Contrast Rating, are selected from several viewpoints that are considered to be important observation points in the vicinity of the project. Factors for selecting KOPs include angle of observation, number of viewers, length of time the project is in view, relative project size, season of use, and light conditions. BLM Manual 8400 states that linear projects such as power lines should be rated from several viewpoints representing the most critical viewpoints (e.g., views from communities, road crossings typical views encountered in representative landscapes if not covered by critical viewpoints). Information regarding each stationary viewing platform is provided in Table 3-413, including general locations and availability of simulations from each location. While many Sensitive Viewing Platforms are chosen for general analysis purposes, some platforms have been specifically chosen by the BLM. The platforms selected by the BLM listed in Table 3-413 include a footnote next to the platform number (i.e., 5-32[1] Oregon Trail Kiwanis Club Memorial). Because compliance for both visual- and NHT-related stationary viewing platforms is considered within this section, Table 3-413 also includes information regarding both types of platforms.

Linear Sensitive Viewing Platforms include the scenic byways listed in Table 3-402, as well as interstate, U.S. highway, state route, USFS roads and sensitive local routes within the study corridor. The interstate and state routes are listed in Table 3-414 and are shown on MV-23.

Special Management Areas

The B2H Project could have potential effects on SMAs within the study corridor—either by direct crossings of the B2H Project through these areas or by the B2H Project's presence within the viewshed of the SMAs. There are four SMAs that could be affected by the B2H Project (MV-23), all of which are managed by the BLM. While there are other SMAs within the study corridor, the four listed below have scenic resources identified as qualities that were considered as part of the rationale for the designation for special management. The SMAs with scenic qualities include:

- Owyhee River Below the Dam ACEC
- Owyhee Views ACEC
- Powder River ACEC
- Wild Horse Basin WSA OR-034-118

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
Recreational Stationary Key Observation Points					
1	Oregon	2-16	Lindsay Prairie Preserve	BA-003 Longhorn	Recreational platform 2-16 is located along Little Juniper Lane adjacent to the Lindsay Prairie Preserve approximately 1.5 miles from transmission line components.
1	Oregon	2-17	Boardman Research Natural Area – Bombing Range Road	BA-003 Longhorn	Recreational platform 2-17 is located along Bombing Range Road adjacent to next to the Boardman Research Natural Area and is part of the Naval Weapons Systems Training Facility.
1	Oregon	2-18	Boardman Conservation Area-Tower Road south	BA-003 Longhorn	Platform 2-18 is located along Tower Road adjacent to the Boardman Grasslands Conservation Area approximately 0.5 mile from the Boardman Generating Plan and is part of the Naval Weapons Systems Training Facility.
1	Oregon	3-3	Blue Mountain State Scenic Corridor	BA-011 Blue Mountain Forest	Recreational platform 3-3 is located along I-84 and is more than 2.0 miles away from the nearest project component near the Umatilla National Forest.
1	Oregon	3-20	McKay Creek National Wildlife Refuge – Boat Launch	BA-007 McKay	Recreational platform 3-20 is located within the McKay Creek National Wildlife Refuge of the U.S. Fish and Wildlife Service, near the northern boundary of the study corridor.
1	Oregon	3-21	McKay Creek National Wildlife Refuge – Spring Creek Road	BA-007 McKay	Recreational platform 3-21 is located along Spring Creek Road in a predominately agricultural landscape and is near the McKay Creek National Wildlife Refuge which is a popular area that offers many recreational opportunities.
2	Oregon	3-24	Meacham Divide Nordic Skiing Area	BA-011 Blue Mountains Forest	Recreational platform 3-24 is located at the parking area for the Meacham Divide Nordic Skiing Area within a forested landscape. This is part of the Meacham Divide Nordic Area Trail System.
2	Oregon	4-3	Bird Track Springs USFS Campground	BA-018 Grand Ronde River	Recreational platform 4-3 is located at Bird Track Springs Campground within a forested landscape on USFS- administered lands.
2	Oregon	4-4	Blue Mountain Crossing Sno-Park	BA-011 Blue Mountains Forest	Recreational platform 4-4 is located at the Blue Mountain Crossing Sno-Park recreation area west of I-84 within a forested landscape on USFS-administered lands. This also is a part of the Meacham Divide Nordic Area Trail System.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
2	Oregon	4-5[2]	Blue Mountain Forest State Scenic Corridor - Old Emigrant Hill Scenic Frontage Rd	BA-011 Blue Mountains Forest	Recreational platform 4-5 is located on the Old Emigrant Hill Scenic Frontage Road and is less than 0.1 mile away from the nearest visible project component This corridor lies along the Old Oregon Trail Highway between Deadman's Pass and Spring Creek. Refer to Appendix H3 for simulation. Note: H- Frame wooden structures would be used throughout this area as a mitigation measure.
2	Oregon	4-6	Blue Mountain Forest State Scenic Corridor - Summit Rd (Exit 243)	BA-011 Blue Mountains Forest	Recreational platform 4-6 is located west of I-84 on the Old Emigrant Hill Scenic Frontage Road. Blue Mountain Crossing Sno-Park recreation area west of I-84 within a forested landscape on USFS-administered lands. This road leads to the Meacham Divide Nordic Area Trail System.
3	Oregon	4-17	Grande Tour Oregon Tour Route – Thief Valley Reservoir	BA-016 Pyles Canyon and Thief Valley	Recreational platform 4-17 is located on a parking lot overlooking Thief Valley Reservoir 1.2 miles away from the nearest visible project component. Viewer position from this platform would be inferior.
2	Oregon	4-19	Hilgard Junction State Park	BA-018 Grand Ronde River	Recreational platform 4-19 is located at the Hilgard Junction State Park adjacent to Hilgard Highway near the town of Hilgard within a mountainous and forested landscape.
2	Oregon	4-26	Ladd Marsh Wildlife Area – Foothill Road	BA-012 Grand Ronde Valley	Recreational platform 4-26 is located along Foothill Road near Ladd March Wildlife Area at the base of rolling foothills. The Ladd Marsh Wildlife Area encompasses one of the largest wetlands in Northeast Oregon.
2	Oregon	4-28	Morgan Lake Park	BA-011 Blue Mountains Forest	Recreational platform 4-28 is located at Morgan Lake Park within an open plateau area approximately 3 miles west of the town of La Grande. This picturesque landscape offers many recreational opportunities such as fishing and camping. Refer to Appendix H3 for simulation.
2	Oregon	4-33	Blue Mountain Forest Double Parking Lot	BA-011 Blue Mountains Forest	Recreational platform 4-33 is located east of I-84 at the uppermost parking lot in proximity of the Oregon Trail Interpretive Park. It is approximately 1 mile away from the Applicant's Proposed Alternative Action project component with a predominantly screened view of the project components.
2	Oregon	4-40[2]	Spring Creek USFS Campground	BA-011 Blue Mountains Forest	Recreational platform 4-40 is located at the Spring Creek Campground located within a forested landscape on USFS-administered lands west of I-84. Refer to Appendix H3 for simulation. Note: H- Frame wooden structures will be used throughout this area as a mitigation measure.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
4	Oregon	5-13	Farewell Bend State Recreation Area	BA-028 Brownlee Reservoir	Recreational platform 5-13 is located southeast of the community of Huntington along the Snake River on private land. This area provides many recreational opportunities such as boating, fishing, water skiing, camping, and picnicking. This area also has historic markers and interpretive signage on information regarding the Farewill Bend's significance on the Oregon Trail.
3	Oregon	5-34[1]	Powder River ACEC	BA-014 Blue and Wallowa Foothills	Recreational platform 5-34 possesses a scenic component associated with the Powder Wild and Scenic River designation contained within the ACEC. Visitor use in the area is less than 250 individuals per year and associated primarily with hunting activities. Visitors are generally focused on the distant panoramic views seen from the platform rather than the ACEC itself.
4	Oregon	5-59[1]	Microwave Spring	BA-025 Juniper and Sugarloaf Mountains	Recreational platform 5-59 is located within a mountainous landscape on BLM-administered. Use is generally low with less than 50 visitors per year and is predominantly local ranching activities and late season hunting.
3	Oregon	5-81[1]	Burnt River	BA-025 Juniper and Sugarloaf Mountains	Recreational platform 5-81 is located on State/private but selected as a prominent view point of BLM VRM II lands and extreme use numbers associated with interstate travel I-84 traffic through the B2H Project area (approx. 8,000 – 10,000 vehicles daily according to 2013 traffic volume data from the Oregon Department of Transportation).
3	Oregon	5-84[1]	Virtue Flat OHV Area	BA-021 Virtue Flat	Recreational platform 5-84 is located approximately 5 miles east of Baker City, Oregon on BLM-administered lands approximately 2 miles from project components. The 4,918 acre site is utilized year around by approximately 7,000-10,000 visitors annually for the purpose of concentrated motorized use as well as other general recreational pursuits.
4	Oregon	7-1	Weiser Dunes OHV Area	FR-028 Brownlee Reservoir	Recreational platform 7-1 is located within a rolling and foothill landscape adjacent to the Snake River on BLM- administered lands. These dunes provide approximately 100 acres of sand dunes to recreationist managed by the BLM Boise District Office.
4	Oregon	7-6	Steck Park BLM Recreation Site	FR-028 Brownlee Reservoir	Recreational platform 7-6 is located within an enclosed river canyon adjacent to the Snake River on private land. This area offers an access point to Brownlee Reservoir along the Snake River from the Idaho side of Hells Canyon.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
5	Oregon	8-4[1]	Board Corral Mountain	MA-075 North Alkali	Recreational platform 8-4 is located near the intersection of Succor Creek Road and Fisherman Road in an undeveloped area of eastern Malheur County, approximately 10 miles south of Adrian, Oregon. Platform 8-4 is surrounded by federal lands managed by the BLM; the lands west of the Succor Creek Road are within the Board Corral Mountain Wilderness Inventory Unit. Typical use is by people traveling through to Succor Creek Campground.
4	Oregon	8-5	Bully Creek Reservoir	MA-038 Hope Butte	Recreational platform 8-5 is located near a residential community and recreation destination on Reclamation land. This area offers many recreational opportunities such as water sports, fishing, and camping.
5	Oregon	8-18	Lake Owyhee State Park	MA-073 Iron Mountain	Recreational platform 8-18 is located near Lake Owyhee State Park along Owyhee Lake Road on Reclamation administered land. This area is great for camping, boating, and fishing. Located in a deep canyon, views offer a colorful canyon die to the volcanic rock formations.
5	Oregon	8-21[1]	McIntyre Ridge	MA-075 North Alkali	Recreational platform 8-21 is located in the Succor Creek area of eastern Malheur County, approximately 13 miles south of Adrian, Oregon and the same distance east of Lake Owyhee. The use is generally low and mostly hunters and ATV use.
5	Oregon	8-33[1]	Double Mountain–Twin Springs Road	MA-041 Sourdough Basin	Recreational platform 8-33 is located on Twin Springs Road in a largely undeveloped area of northeastern Malheur County, approximately 19 miles southwest of Vale, Oregon. The site is in a large area of contiguous federal lands managed by the BLM, and is adjacent to an area identified as the Double Mountain Wilderness Characteristics Inventory Unit. The use is low.
4	Oregon	8-34[1]	South Alkali Sand Hills ACEC	MA-040 Moores Hollow	Recreational platform 8-34 is located in a remote and undeveloped part of Malheur County approximately 6 miles northeast of Vale, Oregon. The site is near the northern edge of the South Alkali Sand Hills ACEC. Access to the site is from Alkali Gulch Road.
5	Oregon	8-51	Big Bend Access Site	MA-039 Treasure Valley	Recreational platform 8-51 is located south of the community of Adrian, Oregon along SR 201 within a rural, agricultural at the foot of sloping landforms on Oregon State-administered land.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
5	Oregon	8-52[1, 2]	Lower Owyhee Interpretive Site	BA-026 Durkee Creek	Recreational platform 8-52 is located in Owyhee Canyon at the Lower Owyhee Canyon Watchable Wildlife Area interpretive site within the Owyhee River Below the Dam SRMA along the Owyhee Lake Road, approximately 7 miles west of Adrian, Oregon. The use is moderate to high due to the restroom. Refer to Appendix H3 for simulation.
5	Oregon	8-74[1]	McIntyre Ridge–Succor Creek Road	MA-075 North Alkali	Recreational platform 8-74 is located on Succor Creek area of eastern Malheur County, approximately 14 miles south of Adrian, Oregon and the same distance east of Lake Owyhee.
5	Oregon	8-75[1]	Antelope Creek	MA-077 Antelope Springs	Recreational platform 8-75 is located in the Succor Creek area of eastern Malheur County, approximately 15 miles south of Adrian, 14 miles east of Lake Owyhee, and 1.5 mile west of the Idaho state line.
5	Oregon	8-84[1]	Burnt Mountain (Old Mormon Hand Cart Trail)	MA-122 Owyhee River	Recreational platform 8-84 is located in Owyhee Canyon, a short distance to the west of the river and approximately 1.6 miles northwest of Owyhee Dam. The use is moderate with ATV users and people accessing the reservoir.
5	Oregon	8-85[1]	Sourdough Mountain–Twin Springs Road	MA-041 Sourdough Basin	Recreational platform 8-85 is located at the intersection of Twin Springs Road and Rock Canyon Road in an undeveloped part of northern Malheur County.
5	Oregon	8-88[1]	Broken Rim– Hoo Doo Road North	MA-058 Hoodoo Ridge	Recreational platform 8-88 is located on Hoo Doo Road North in the Sand Hollow area of northeastern Malheur County, approximately 12 miles southwest of Vale, Oregon and 9 miles east of Harper, Oregon.
5	Oregon	8-90[1]	Double Mountain–Rock Canyon Road	MA-041 Sourdough Basin	Recreational platform 8-90 is located on Rock Canyon Road (also known as Negro Rock Creek Road) in an isolated part of northern Malheur County.
5	Oregon	8-91[1]	Double Mountain–Twin Springs Road	MA-041 Sourdough Basin	Recreational platform 8-91 is located on Twin Springs Road in a largely undeveloped area of northeastern Malheur County, approximately 19 miles southwest of Vale, Oregon.
5	Oregon	8-93[1]	Double Mountain–Negro Rock Creek Middle	MA-041 Sourdough Basin	Recreational platform 8-93 is located on Rock Canyon Road in an isolated part of northern Malheur County, approximately 16 miles southwest of Vale, Oregon.
5	Oregon	8-94	Double Mountain–Negro Rock Creek South	MA-041 Sourdough Basin	Recreational platform 8-94 is located on Rock Canyon Road within a remote landscape that consists of sloping landforms and valley bottoms on private land.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
5	Oregon	8-95[1]	Lower Owyhee River Site H2	MA-122 Owyhee River	Recreational platform 8-95 is located in Owyhee Canyon along Owyhee Lake Road, approximately 7 miles west of Adrian, Oregon. Platform 8-95 is located on BLM- managed lands within the Owyhee River Below the Dam ACEC. A moderately use fishing access area is the specific location of this platform.
5	Oregon	8-96[1, 2]	Lower Owyhee River Site H1	MA-122 Owyhee River	Recreational platform 8-96 is located in Owyhee Canyon along Owyhee Lake Road, approximately 7 miles west of Adrian, Oregon. Platform 8-96 is located on BLM-managed lands within the Owyhee River Below the Dam ACEC. A moderately use fishing access area is the specific location of this platform. Refer to Appendix H3 for simulation.
6	Idaho	10-12	Trappers Flat Snake River Access Site	FR-029 Snake River/Given Hot Springs	Recreational platform 10-12 is located adjacent to the Snake River within an agricultural landscape on Idaho State land.
6	Idaho	10-17	Snake River Overlook - Pump Road	FR-029 Snake River/Given Hot Springs	Recreational platform 10-17 is located adjacent to the Snake River within an agricultural landscape on private land.
6	Idaho	10-19	Map Rock Snake River Access Site	FR-029 Snake River/Given Hot Springs	Recreational platform 10-19 is located adjacent to the Snake River within an agricultural landscape on Idaho State land.
6	Idaho	12-4	Givens Hot Springs Campground	OW-019 Treasure Valley	Recreational platform 12-4 is located adjacent to the Snake River within an agricultural landscape on Idaho State land.
6	Idaho	12-5[1]	Hemingway Butte OHV Recreation Area	OW-006 Willow Spring	Recreational platform 12-5 is located within a popular motorized recreation area that receives more than 50,000 visitors annually. The use at this platform is due to the areas popularity, which is part of the Murphy Subregion Travel Management Plan area.
6	Idaho	12-8[1]	Jump Creek Canyon ACEC	OW-020 Jump Creek	Recreational platform 12-8 is located within the Jump Creek Recreation Area, which is a popular day-use recreation area that receives roughly 25,000 visitors annually. The platform is just outside of the Jump Creek Canyon ACEC. The use of this Platform is due to the areas popularity and outstanding scenic quality.
6	Idaho	12-17	Squaw Creek Canyon Entrance	OW-005 Squaw Creek	Recreational platform 12-17 is located on Summer Camp Road within a remote landscape that consists of rolling landforms on private land.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
6	Idaho	12-18[1]	Squaw Creek Research Natural Area	OW-001 Owyhee Mountains	Recreational platform 12-18 is located on BLM-administered lands along U.S Highway 95 approximately 8 miles southwest of Marsing, Idaho. BLM-administered lands in this area receive low to moderate use. The primary recreational uses in this area are hunting and OHV riding.
6	Idaho	12-21[1]	Wilson Creek Trailhead	OW-006 Willow Spring	Recreational platform 12-21 is located within a popular non-motorized recreation area (equestrian, mountain bikes, and hikers). The area receives an estimated 30,000 visitors annually and is part of the Wilson Creek Subregion Travel Management Plan area.
6	Idaho	12-22[1]	Wilson Creek Wayside	OW-006 Willow Spring	Recreational platform 12-22 is located within a popular non-motorized recreation area (equestrian, mountain bikes, and hikers). The area receives an estimated 30,000 visitors annually and is part of the Wilson Creek Subregion Travel Management Plan area.
6	Idaho	12-23[1]	Eastern Terminus - Wilson Cemetery	OW-006 Willow Spring	Recreational platform 12-23 is located on the border of BLM-administered and private land. Public uses within this area are low due to the proximity to private property. The use of this platform is predominantly associated with the private land owners within the surrounding area. This platform is located near several existing transmission lines, a power substation and a cemetery.
6	Oregon	13-1[1]	Owyhee Wild and Scenic River	MA-060 Owyhee Tunnel	Recreational platform 13-1 is located on a BLM road south of the Owyhee River overlooking this recreational corridor and is approximately 0.4 miles east from the Owyhee Below the Dam ACEC.
Residential Stationary Key Observation Points					
1	Oregon	2-20	Butter Creek Junction	BA-004 Butter Creek	Residential platform 2-20 is located along Oregon Route 207, near junction of Lexington Echo Highway, Hemiston Highway, and Butter Creek Road in a predominately agricultural landscape south of Boardman, Oregon.
1	Oregon	2-23	Wilson Lane Southeast	BA-003 Longhorn	Residential platform 2-23 is located along Wilson Lane in a rural residential area east of Boardman, Oregon in a predominately agricultural landscape.
1	Oregon	3-12	Pilot Rock Community	BA-008 Spring Hollow	Residential platform 3-12 is located within an urban residential area of Pilot Rock, Oregon. This community is found in Umatilla County and has an approximate population of 1,500 and is part of the Pendleton-Hermiston Micropolitan Statistical Area.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
2	Oregon	3-40[2]	Community of Echo	BA-003 Longhorn	Residential platform 3-40 is located at the edge of the Echo community. This community is found in Umatilla County and is part of the Pendleton-Hermiston Micropolitan Statistical Area and has an approximate population of 700. Refer to Appendix H3 for simulation.
2	Oregon	3-41	City of Pendleton	BA-008 Spring Hollow	Residential platform 3-41 is located at the edge of the City of Pendleton. Along the Umatilla River, this City is found in Umatilla County and has an approximate population of 16,900
3	Oregon	4-10	North Powder Community	BA-015 Baker Valley	Residential platform 4-10 is located east of the residential area of North Powder, Oregon along La Grande- Baker Highway in Union County.
2	Oregon	4-51	La Grande	BA-012 Grand Ronde Valley	Residential platform 4-51 is located within the town of La Grande on private land east of I-84. La Grande has an estimated population of 13,026.
2	Oregon	4-55	Elk Song Ranch	BA-011 Blue Mountains Forest	Residential platform 4-55 is within an open plateau area. This area would be in proximity to Morgan Lake and is one of the best fair chase elk hunting areas around the state along with more than 5,000 acres of timber land.
4	Oregon	5-5	Huntington Community	BA-027 Caribou Bar	Residential platform Huntington community is located near the Snake River in Oregon and along I- 84 and U.S. Route 30. User type includes static residential views and recreational travelers (approximately. 490 vehicles - according to 2013 traffic volumes provided by the Oregon Department of Transportation) visiting the area for water based recreational activities associated with the Snake River.
3	Oregon	5-82	Durkee Community	BA-026 Durkee Creek	Residential platform, Durkee Community, is an unincorporated community in Baker County, Oregon and is located at the Vandercar Road exit off I- 84. This platform is on the edge of a privately owned parcel of land and provides view of project components that would be located on BLM-administered lands. Platform 5-92 is on a high use corridor in addition to this local community, approximately 2 miles from project components. User type includes static residential views and recreational travelers via U.S. 30 (approximately. 490 vehicles per day –according to 2013 traffic volumes provided by the Oregon Department of Transportation).
4	Oregon	8-6	Brogan Community	MA-039 Treasure Valley	Residential platform 8-6 is located south of the community of Brogan, Oregon along John Day Highway on private land.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
4	Oregon	8-8	Jamieson Community	MA-039 Treasure Valley	Residential platform 8-8 is located south of the community of Jamieson, Oregon along John Day Highway on private land.
5	Oregon	8-102	Succor Creek Rural Area	MA-039 Treasure Valley	Residential platform 8-102 is located within a rural residential community along Succor Creek Road on private land approximately 1 mile from project components on BLM-administered lands.
6	Idaho	12-13	China Ditch Road Rural Residential Area	OW-006 Willow Spring	Residential platform 12-13 is a small isolated piece of BLM-administered land surrounded by private land in a rural residential area southwest of Wilson, Idaho. The use of this platform is generally low. An existing 500-kV transmission line is located approximately 0.2 mile southwest and an existing substation is located 0.3 mile north of the Platform. The primary focus of the viewer's attention is of the existing substation.
6	Idaho	12-27	Poison Creek Rural Area	OW-019 Treasure Valley	Residential platform 12-27 is located on Poison Creek Road within an agricultural landscape that consists on private land.
6	Idaho	12-28	Jump Creek Rural Area	OW-001 Owyhee Mountains	Residential platform 12-28 is located on South Jump Creek Road within an agricultural landscape that consists on private land.
National Historic Trail Related Key Observation Points					
1	Oregon	2-22	Well Spring Oregon Trail Site	BA-003 Longhorn	Platform 2-22 is located along Immigrant Lane near the Well Spring Oregon Trail Site. Platform 2-22 is within a predominately shrub steppe environment on NWSTF Boardman.
1	Oregon	3-16	Emigrant Springs State Heritage Area	BA-011 Blue Mountain Forest	Platform 3-16 is located near I-84 and associated with the Emigrant Springs State Heritage Area within a forested landscape approximately 4 miles from the nearest project components.
2	Oregon	3-27	Oregon Trail ACEC-Oregon Trail Road	BA-003 Longhorn	Platform 3-27 is located ¾ of a mile north of the Oregon Trail Road in Umatilla County.
2	Oregon	4-32[2]	Oregon Trail Interpretive Park	BA-011 Blue Mountains Forest	Platform 4-32 is located east of I-84 in proximity of the Oregon Trail Interpretive Park within a forested landscape located on USFS-administered lands. Refer to Appendix H3 for simulation. Note: H- Frame wooden structures will be used throughout this area as a mitigation measure.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
3	Oregon	5-25a[1, 2]	National Historic Oregon Trail Interpretive Center (Flagstaff Hill Trail, South)	BA-014 Blue and Wallowa Foothills	Platform 5-25a is along the Flagstaff Hill Trail at the National Historic Oregon Trail Interpretive Center (NHOTIC), which is an area with high visitation use (50,680 visitors in 2013). Scenic sensitivity of users is high with specific expectations associated with the Oregon Trail and the surrounding landscape in which this historic migration occurred. Refer to Appendix H3 for simulation.
3	Oregon	5-25b[1]	National Historic Oregon Trail Interpretive Center (Flagstaff Hill Trail, North)	BA-014 Blue and Wallowa Foothills	Similar to Platform 5-25a, scenic sensitivity of users is high with specific expectations associated with the Flagstaff Hill Trail at the NHOTIC and the surrounding landscape in which this historic migration occurred.
3	Oregon	5-25c[1, 2]	National Historic Oregon Trail Interpretive Center (Panorama Point)	BA-014 Blue and Wallowa Foothills	Similar to the other Sensitive Viewing Platforms located at the NHOTIC, Panorama Point has a high level of visual sensitivity associated with the Oregon Trail and landscape in which this historic migration occurred. Refer to Appendix H3 for simulation.
3	Oregon	5-25d[1, 2]	National Historic Oregon Trail Interpretive Center (Main Building)	BA-014 Blue and Wallowa Foothills	Platform 5-25d is at the Main Building at the NHOTIC, which experiences high visitation use (50,680 visitors in 2013). Scenic sensitivity of users is high with specific expectations associated with the Oregon Trail and landscape in which this historic migration occurred. Refer to Appendix H3 for simulation.
3	Oregon	5-25e[1, 2]	National Historic Oregon Trail Interpretive Center (Wagon Encampment)	BA-014 Blue and Wallowa Foothills	Platform 5-25e is at the Wagon Encampment at the NHOTIC. This platform is located on an elevated landscape on BLM-administered lands. Refer to Appendix H3 for simulation.
3	Oregon	5-26[1]	Oregon Trail ACEC – Hill Creek Road	BA-014 Blue and Wallowa Foothills	Platform 5-26 is located along Hill Creek Road and associated Oregon Trail point of interest. Visitor use is low due because of the lack of public access to the area. Use at this platform is generally limited to local residents and consist of less than 15 visits per year.
3	Oregon	5-30	Oregon Trail Crossing – Plano Road	BA-025 Juniper and Sugarloaf Mountains	Platform 5-30 is 0.5 mile away from the Oregon National Historic Trail. Project component would cross the NHT from this platform.
3	Oregon	5-31	Oregon Trail Crossing –Weatherby Road	BA-027 Caribou Bar	Platform 5-31 is found east of I-84 and is less than 0.1 mile away from the travel route.

Table 3-413. Sensitive Stationary Viewing Platforms					
Segment	**State**	**Platform Number**	**Stationary Sensitive Viewing Platform Name**	**Associated Visual Analysis Unit Number/Name**	**Platform Information**
3	Oregon	5-32[1]	Oregon Trail Kiwanis Club Memorial	BA-014 Blue and Wallowa Foothills	Platform 5-32 is associated with NHOTIC and is located along SR 86 on BLM-administered land within a rolling landscape. Visitors at this location are specifically looking at cultural features and scenic views of the landscape.
3	Oregon	5-33[1]	Oregon Trail Ruts Interpretive Site	BA-021 Virtue Flat	Platform 5-33 is associated with NHOTIC and is located along SR 86 on BLM-administered land within a rolling landscape. Visitors at this location are specifically looking at cultural features and scenic views of the landscape. Use is associated with specific landscape expectations in conjunction with historic human migration of the Oregon Trail.
3	Oregon	5-60[1, 2]	NHOTIC Entrance State Highway 86	BA-021 Virtue Flat	Platform 5-60 is a special designation area with high visitation use (50,680 in 2013) with focused landscape attention within BLM-administered lands. Refer to Appendix H3 for simulation.
4	Oregon	8-1[1]	Alkali Springs Interpretive Site	MA-120 Alkali Flats	Platform 8-1 is located within the Tub Mountain Segment of the National Historic Oregon Trail ACEC designated by the BLM. Platform 8-1 is at a small interpretive site near the south end of the ACEC parcel, along Old Oregon Trail Road approximately 8 miles north of Vale, Oregon. Visitor use is low. Facilities at the site include a small parking area and an interpretive panel describing Oregon Trail emigrants' use of the site as a "nooning" stop. This platform is on the west edge of the ACEC area; lands to the east of the Platform are federal lands managed by the BLM, while extensive areas of privately owned rangeland are to the west. The site is along Old Oregon Trail Road, a gravel- surfaced road maintained by Malheur County that is roughly parallel to the Oregon Trail route and overlaps it in places.
4	Oregon	8-3[1, 2]	Oregon Trail ACEC - Birch Creek	MA-040 Moores Hollow	Platform 8-3 is located at the Birch Creek Interpretive Site, a BLM recreation site with minimal development within the Birch Creek Segment of the National Historic Oregon Trail ACEC. The site is in the northeastern corner of Malheur County approximately 6 miles southeast of Huntington, Oregon and less than 1 mile west from I-84. Visitor use is low. Refer to Appendix H3 for simulation.

Table 3-413. Sensitive Stationary Viewing Platforms

Segment	State	Platform Number	Stationary Sensitive Viewing Platform Name	Associated Visual Analysis Unit Number/Name	Platform Information
4	Oregon	8-24	Oregon Trail ACEC – Tub Mountain	MA-040 Moores Hollow	Platform 8-24 is located within the Tub Mountain Segment of the National Historic Oregon Trail ACEC designated by the BLM. The site is near the north end of the ACEC parcel, along Old Oregon Trail Road approximately 8 miles south of Huntington, Oregon and 17 miles north of Vale, Oregon. Old Oregon Trail Road is a native-surfaced, two-track road maintained by Malheur County that is roughly parallel to the Oregon Trail route and overlaps it in places. The use is generally low.
5	Oregon	8-103	Tub Springs Interpretive Site	MA-120 Alkali Flats	Platform 8-103 is located near Tub Mountain and is approximately 1.5 miles away from project components.

Table Notes:
[1]Sensitive viewing platforms selected by the BLM
[2]Simulations for Platform Numbers 3-40, 4-5, 4-32, 4-40, 5-25a, 5-25c, 5-25d, 5-25e, 5-60, 8-3, 8-52, and 8-96 can be found in Appendix H3.

Table 3-414. Sensitive Linear Viewing Platforms		
Segment	**Sensitive Linear Viewing Platforms**	**County, and State Location**
Sensitive Linear Viewing Platforms Associated with General Travel Routes		
Interstate and U.S. Routes		
1	I-82	Umatilla County, Oregon
1, 2, 3, and 4	I-84	Baker, Malheur, Morrow, Umatilla, and Union counties, Oregon
5	U.S. Highway 20	Malheur County, Oregon
4	U.S. Highway 26	Malheur County, Oregon
1	U.S. Highway 207	Umatilla County, Oregon
1	U.S. Highway 395	Umatilla County, Oregon
State Routes		
1	State Highway 74	Baker County, Oregon
2, 3	State Highway 203	Baker and Union counties, Oregon
2	State Highway 244	Union County, Oregon
Local Routes		
3	Alder Creek Road	Baker County, Oregon
3	Daly Creek Road	Baker County, Oregon
3	Eagle Creek Road	Baker and Union counties, Oregon
3	Manning Creek Road	Baker County, Oregon
5	Mitchell Butte Road	Malheur County, Oregon
3	Sparta Road	Baker County, Oregon
Sensitive Linear Viewing Platforms Associated with Recreation		
Local Routes		
5	Owyhee River Canyon Road	Malheur County, Oregon
3	Powder River Wild and Scenic River Corridor/ Thief Valley Reservoir Road	Baker and Union counties, Oregon
U.S. Forest Service Roads		
2	U.S. Forest Service (USFS) Road 21	Union County, Oregon
2	USFS Road 43 - Ladd Canyon Road	Union County, Oregon
3	USFS Road 67 - Big Creek	Baker and Union counties, Oregon
3	USFS Road 70	Baker County, Oregon
3	USFS Road 250	Baker County, Oregon
Scenic Byways, Back Country Byways, and Scenic Bikeways		
1	Blue Mountain Scenic Byway	Gilliam and Morrow counties, Oregon
3	Elkhorn Scenic Byway	Baker County, Oregon
2, 3	Grande Tour Scenic Bikeway	Union County, Oregon
2, 3	Grande Tour Route	Union County, Oregon
2, 3	Hells Canyon All American Road	Baker and Union counties, Oregon
6	Snake River Canyon Scenic Byway	Canyon County, Idaho
3, 4	Snake River-Mormon Basin Back Country Byway	Baker County, Oregon

DIRECT AND INDIRECT EFFECTS

The construction, operation, and maintenance of the B2H Project potentially would result in direct and indirect effects on visual resources. These potential effects would be directly related to potential

changes to landscape character and scenic quality; views from stationary and linear Sensitive Viewing Platforms; and potential views from SMAs. To provide a better understanding of what types of uses these impacts are associated with, the discussion of effects has been organized as follows:

- **Effects on Landscape Character and Scenic Quality.** These discussions are focused on the most critical potential impacts on the physical characteristics of the landscape (landscape character) and impacts on the attributed value of the landscape (scenic quality) for each VAU. These narratives include a general description of the landscape type, as well as the determination of impacts on the scenic quality ratings for each VAU. Inventory data and residual impacts are shown on large-format map MV-22. A separate analysis to determine the change in the cultural modification score associated with BLM SQRUs in the Malheur and Owyhee Field Offices is located in Appendix H.
- **Effects on Residential Views.** These descriptions are focused on the most critical potential impacts on views from residences within 0.5 mile of the alternatives, views from incorporated community boundaries, and views from stationary Sensitive Viewing Platforms that are related to residences. The narratives include general descriptions of expected changes to views from these viewing locations.
- **Effects on Recreational Views.** These descriptions are focused on the most critical potential impacts on views from stationary and linear Sensitive Viewing Platforms that are related to recreation. Recreation-related stationary platforms include specific recreation locations such as camp sites or trailheads, while the recreation-related linear platforms include routes such as scenic byways or bikeways. General descriptions of expected changes to views from these viewing locations are provided within the narratives.
- **Effects on Views from Travel Routes.** These descriptions are focused on the most critical potential impacts on views from travel routes that are not specifically or solely intended for recreation. Linear platforms discussed within these narratives include primary and secondary travel routes such as interstate and state highways. These narratives include general descriptions of expected changes to views from these viewing locations.

Contrast-rating worksheets completed from the BLM-related Sensitive Viewing Platforms, as well as visual simulations from selected viewing platforms, are located in Appendix H3. Viewer inventory data and residual impacts are shown on large-format map MV-23.

In addition to descriptions of potential effects, these effects are then considered in determining whether the alternative route would be in conformance with management objectives that have been established within the study corridor. These determinations are discussed under the heading “Conformance with Management Objectives” for each alternative route and route variation. BLM contrast-rating forms, associated with determining compliance with BLM VRM class objectives, are located in Appendix H. In areas where the B2H Project was found to be out of conformance with visual management objectives, proposed plan amendments for visual resources, including maps depicting the areas to be amended, are described in Section 3.4.

NO ACTION ALTERNATIVE

Under this alternative, the existing landscape character and scenic quality would remain as they presently exist. There would likewise be no identifiable impact on the casual viewer from sensitive stationary or linear viewing platforms or on views from the SMAs.

EFFECTS COMMON TO ALL ALTERNATIVES

Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on visual resources would be minor. Vegetation clearing for the geotechnical investigation would be limited and the time frame for vegetation to reestablish would be expected within two seasons in areas that are reseeded. Because vegetation clearing would be minimal, long-term impacts on the landscape would be low. Because of the low level of change to the characteristic landscape, low to no contrast would occur. Thus the geotechnical investigation activities would conform with BLM and USFS visual management objectives.

SEGMENT 1—MORROW-UMATILLA

The impacts associated with each alternative and route variation in Segment 1 are described in this section. Supporting information is presented in Table 3-415, Table 3-416, Table 3-417, and Table 3-418). Table 3-415 presents the scenic quality impacts by VAU for each alternative route and route variation within Segment 1, including the acreage within the foreground and middleground of each VAU with views of the B2H Project. The existing scenic quality rating of each VAU also is included in this table, along with the residual scenic quality rating and score for both the foreground and middleground acreage. The residual scenic quality scores are based on the amount of change in score anticipated based on the criteria presented in Table 3-403.

Information on potential impacts on viewers is represented in Table 3-415 and Table 3-417. More specifically, Table 3-416 presents an overall comparison of impacts on viewers by alternative route and route variation, as measured in miles of high, moderate, and low impacts. The mileages of impacts are associated with the impacts as they relate back to the alignment of each alternative in Segment 1. This table also includes the total mileage of each alignment. Table 3-417 presents impacts associated with Sensitive Viewing Platforms and information on conformance with BLM VRM objectives for BLM-related Sensitive Viewing Platforms in Segment 1. Each assessment of conformance also is accompanied by the length of the alternative that can be viewed crossing the associated BLM VRM Class(es).

Conformance with USFS VQOs is presented in Table 3-418. These determinations are based on the expected level of impact on the landscape character within VAU BA-011 (Blue Mountains Forest) (the only VAU with USFS-administered lands crossed by the B2H Project in Segment 1). The determinations of conformance with USFS VQOs are based on the criteria provided in Table 3-403.

At the end of this section is a conclusion of the impacts on Segment 1, which provides an overview of impacts as well as to which alternative routes and/or variations would be preferable. Because there are several facets to consider when analyzing potential impacts on visual resources (e.g. landscape

character and scenic quality, viewers, and plan conformance), this overview provides preferences associated with each of those facets.

Table 3-415. Scenic Quality Impacts by Visual Analysis Unit for Segment 1—Morrow-Umatilla

Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-001 Columbia River Valley								
Applicant's Proposed Action	0	5,054	C (8.5)	No change	Moderate	C (8.5)	C (8.5)	0
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	0	5,053	C (8.5)	No change	Moderate	C (8.5)	C (7.5)	5,053
Applicant's Proposed Action – Southern Route	0	5,054	C (8.5)	No change	Moderate	C (8.5)	C (7.5)	5,054
West of Bombing Range Road – Southern Route	0	5,054	C (8.5)	No change	Moderate	C (8.5)	C (7.5)	5,054
Longhorn	0	4,851	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	4,851
Interstate 84	0	4,851	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	4,851
Variation S1-A1	*Not applicable*							
Variation S1-A2	*Not applicable*							
Interstate 84 – Southern Route	0	4,851	C (8.5)	No change	Moderate	C (8.5)	C (7.5)	4,851
BA-003 Longhorn								
Applicant's Proposed Action	0	4,851	C (8.5)	No change	Moderate	C (8.5)	C (7.5)	4,851
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	17,562	146,315	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	163,877
Applicant's Proposed Action – Southern Route	17,375	145,563	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	162,938
West of Bombing Range Road – Southern Route	17,675	133,153	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	150,828
Longhorn	14,997	129,783	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	144,780
Interstate 84	24,694	190,335	C (8.5)	Low	Low	C (8.5)	C (8.5)	0
Variation S1-A1	*10,032*	*82,853*	*C (8.5)*	*Moderate*	*Low*	*C (7.5)*	*C (8.5)*	*10,032*
Variation S1-A2	*2,161*	*65,446*	*C (8.5)*	*Low*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Interstate 84 – Southern Route	24,694	190,335	C (8.5)	Low	Low	C (8.5)	C (8.5)	0

Table 3-415. Scenic Quality Impacts by Visual Analysis Unit for Segment 1—Morrow-Umatilla								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-004 Butter Creek								
Applicant's Proposed Action	505	14,443	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	14,948
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	505	14,443	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	14,948
Applicant's Proposed Action – Southern Route	505	14,443	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	14,948
West of Bombing Range Road – Southern Route	2,307	12,478	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	17,785
Longhorn	505	14,443	C (8.5)	Moderate	Moderate	C (7.5)	C (7.5)	14,948
Interstate 84	Not applicable							
Variation S1-A1	*Not applicable*							
Variation S1-A2	*Not applicable*							
Interstate 84 – Southern Route	Not applicable							
BA-005 Matlock								
Applicant's Proposed Action	2,576	31,055	C (10.0)	High	Moderate	C (8.5)	C (9.0)	33,631
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	2,576	31,055	C (10.0)	High	Moderate	C (8.5)	C (9.0)	33,631
Applicant's Proposed Action – Southern Route	4,516	50,841	C (10.0)	High	Low	C (8.5)	C (10.0)	55,357
West of Bombing Range Road – Southern Route	15,976	93,548	C (10.0)	High	Low	C (8.5)	C (10.0)	109,524
Longhorn	2,576	31,055	C (10.0)	High	Moderate	C (8.5)	C (9.0)	33,631
Interstate 84	0	4,144	C (10.0)	No change	Low	C (10.0)	C (10.0)	4,144
Variation S1-A1	*Not applicable*							
Variation S1-A2	*Not applicable*							
Interstate 84 – Southern Route	1,940	26,250	C (10.0)	No change	Low	C (10.0)	C (10.0)	0

Table 3-415. Scenic Quality Impacts by Visual Analysis Unit for Segment 1—Morrow-Umatilla								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-006 Coombs								
Applicant's Proposed Action	12,138	99,185	C (10.0)	Moderate	Moderate	C (9.0)	C (9.0)	111,323
Variation S1-B1	Not applicable							
Variation S1-B2	Not applicable							
East of Bombing Range Road	18,138	99,185	C (10.0)	Moderate	Moderate	C (9.0)	C (9.0)	117,323
Applicant's Proposed Action – Southern Route	20,640	106,184	C (10.0)	Moderate	Moderate	C (9.0)	C (9.0)	126,824
West of Bombing Range Road – Southern Route	4,874	36,759	C (10.0)	Moderate	Moderate	C (9.0)	C (9.0)	41,633
Longhorn	18,138	99,185	C (10.0)	Moderate	Moderate	C (9.0)	C (9.0)	117,323
Interstate 84	8,071	57,612	C (10.0)	High	Low	C (8.5)	C (10.0)	8,071
Variation S1-A1	*907*	*30,807*	*C (10.0)*	*Moderate*	*Low*	*C (9.0)*	*C (10.0)*	*907*
Variation S1-A2	*7,260*	*47,170*	*C (10.0)*	*Moderate*	*Low*	*C (9.0)*	*C (10.0)*	*7,260*
Interstate 84 – Southern Route	11,471	66,915	C (10.0)	High	Low	C (8.5)	C (10.0)	11,471
BA-007 McKay								
Applicant's Proposed Action	1,246	13,723	C (9.5)	High	Low	C (8.0)	C (9.5)	1,246
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	1,246	13,723	C (9.5)	High	Low	C (8.0)	C (9.5)	1,246
Applicant's Proposed Action – Southern Route	1,328	11,166	C (9.5)	High	Low	C (8.0)	C (9.5)	1,328
West of Bombing Range Road – Southern Route	1,198	9,356	C (9.5)	High	Low	C (8.0)	C (9.5)	1,198
Longhorn	1,246	13,723	C (9.5)	High	Low	C (8.0)	C (9.5)	1,246
Interstate 84	1,246	14,755	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	1,246
Variation S1-A1	*0*	*1,043*	*C (9.5)*	*No change*	*Low*	*C (9.5)*	*C (9.5)*	*0*
Variation S1-A2	*0*	*1,043*	*C (9.5)*	*No change*	*Low*	*C (9.5)*	*C (9.5)*	*0*
Interstate 84 – Southern Route	1,328	14,108	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	1,328

Table 3-415. Scenic Quality Impacts by Visual Analysis Unit for Segment 1—Morrow-Umatilla								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-008 Spring Hollow								
Applicant's Proposed Action	1,644	15,178	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	1,644
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	1,644	15,178	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	1,644
Applicant's Proposed Action – Southern Route	0	4,673	C (9.5)	No change	Low	C (9.5)	C (9.5)	0
West of Bombing Range Road – Southern Route	0	3,031	C (9.5)	No change	Low	C (9.5)	C (9.5)	0
Longhorn	1,644	15,178	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	1,644
Interstate 84	1,644	22,355	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	1,644
Variation S1-A1	*0*	*6,687*	*C (9.5)*	*No change*	*Low*	*C (9.5)*	*C (9.5)*	*0*
Variation S1-A2	*0*	*6,681*	*C (9.5)*	*No change*	*Low*	*C (9.5)*	*C (9.5)*	*0*
Interstate 84 – Southern Route	0	14,051	C (9.5)	No change	Low	C (9.5)	C (9.5)	0
BA-009 Blue Mountains Rocky Ridge								
Applicant's Proposed Action	7,111	48,014	B (16.0)	High	Moderate	B (14.5)	B (15.0)	23,999
Variation S1-B1	*0*	*827*	*B (16.0)*	*No change*	*Low*	*B (16.0)*	*B (16.0)*	*0*
Variation S1-B2	*0*	*827*	*B (16.0)*	*No change*	*Low*	*B (16.0)*	*B (16.0)*	*0*
East of Bombing Range Road	7,111	48,015	B (16.0)	High	Moderate	B (14.5)	B (15.0)	55,126
Applicant's Proposed Action – Southern Route	8,472	57,363	B (16.0)	High	Moderate	B (14.5)	B (15.0)	65,835
West of Bombing Range Road – Southern Route	8,472	57,363	B (16.0)	High	Moderate	B (14.5)	B (15.0)	0
Longhorn	7,111	48,014	B (16.0)	High	Moderate	B (14.5)	B (15.0)	23,999
Interstate 84	7,111	48,014	B (16.0)	High	Moderate	B (14.5)	B (15.0)	23,999
Variation S1-A1	*Not applicable*							
Variation S1-A2	*Not applicable*							
Interstate 84 – Southern Route	8,472	57,363	B (16.0)	High	Moderate	B (14.5)	B (15.0)	65,835

Table 3-415. Scenic Quality Impacts by Visual Analysis Unit for Segment 1—Morrow-Umatilla								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-011 Blue Mountains Forest								
Applicant's Proposed Action	13,205	94,339	B (15.0)	High	Moderate	B (13.5)	B (14.0)	107,544
Variation S1-B1	*4,536*	*48,132*	*B (15.0)*	*High*	*Moderate*	*B (13.5)*	*B (14.0)*	*52,668*
Variation S1-B2	*4,544*	*48,150*	*B (15.0)*	*High*	*Moderate*	*B (13.5)*	*B (14.0)*	*52,694*
East of Bombing Range Road	9,837	56,205	B (15.0)	High	Moderate	B (13.5)	B (14.0)	66,042
Applicant's Proposed Action – Southern Route	9,837	56,205	B (15.0)	High	Moderate	B (13.5)	B (14.0)	66,042
West of Bombing Range Road – Southern Route	9,837	56,205	B (15.0)	High	Moderate	B (13.5)	B (14.0)	66,042
Longhorn	9,837	56,205	B (15.0)	High	Moderate	B (13.5)	B (14.0)	66,042
Interstate 84	9,837	56,205	B (15.0)	High	Moderate	B (13.5)	B (14.0)	66,042
Variation S1-A1	*Not applicable*							
Variation S1-A2	*Not applicable*							
Interstate 84 – Southern Route	9,837	46,205	B (15.0)	High	Moderate	B (13.5)	B (14.0)	56,042
BA-018 Grand Ronde River								
Applicant's Proposed Action	0	3,951	A (21.5)	Low	Low	A (21.5)	A (21.5)	0
Variation S1-B1	*0*	*3,951*	*A (21.5)*	*Low*	*Low*	*A (21.5)*	*A (21.5)*	*0*
Variation S1-B2	*0*	*3,952*	*A (21.5)*	*Low*	*Low*	*A (21.5)*	*A (21.5)*	*0*
East of Bombing Range Road	0	3,951	A (21.5)	Low	Low	A (21.5)	A (21.5)	0
Applicant's Proposed Action – Southern Route	0	3,951	A (21.5)	Low	Low	A (21.5)	A (21.5)	0
West of Bombing Range Road – Southern Route	0	3,951	A (21.5)	Low	Low	A (21.5)	A (21.5)	0
Longhorn	0	3,951	A (21.5)	Low	Low	A (21.5)	A (21.5)	0
Interstate 84	0	3,951	A (21.5)	Low	Low	A (21.5)	A (21.5)	0
Variation S1-A1	*Not applicable*							
Variation S1-A2	*Not applicable*							
Interstate 84 – Southern Route	0	3,951	A (21.5)	Low	Low	A (21.5)	A (21.5)	0

Table 3-415. Scenic Quality Impacts by Visual Analysis Unit for Segment 1—Morrow-Umatilla

Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-032 Umatilla River								
Applicant's Proposed Action	Not applicable							
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	Not applicable							
Applicant's Proposed Action – Southern Route	Not applicable							
West of Bombing Range Road – Southern Route	Not applicable							
Longhorn	Not applicable							
Interstate 84	1,368	15,596	B (16.0)	High	Low	B (14.5)	B (16.0)	1,368
Variation S1-A1	*1,368*	*15,596*	*B (16.0)*	*High*	*Low*	*B (14.5)*	*B (16.0)*	*1,368*
Variation S1-A2	*2,802*	*14,161*	*B (16.0)*	*High*	*Low*	*B (14.5)*	*B (16.0)*	*2,802*
Interstate 84 – Southern Route	1,368	15,596	B (16.0)	High	Low	B (14.5)	B (16.0)	1,368
BR-001 Columbia River Valley								
Applicant's Proposed Action	0	7,845	C (8.5)	No change	Low	Not applicable	C (8.5)	0
Variation S1-B1	*Not applicable*							
Variation S1-B2	*Not applicable*							
East of Bombing Range Road	Not applicable							
Applicant's Proposed Action – Southern Route	0	7,845	C (8.5)	No change	Low	C (8.5)	C (8.5)	0
West of Bombing Range Road – Southern Route	0	7,845	C (8.5)	No change	Low	C (8.5)	C (8.5)	0
Longhorn	0	7,421	C (8.5)	No change	Low	C (8.5)	C (8.5)	0
Interstate 84	0	7,421	C (8.5)	No change	Low	C (8.5)	C (8.5)	0
Variation S1-A1	*Not applicable*							
Variation S1-A2	*Not applicable*							
Interstate 84 – Southern Route	0	7,421	C (8.5)	No change	Low	C (8.5)	C (8.5)	0

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-416. Residual Impacts on Viewers for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Residual Impacts (miles crossed)		
		High	Moderate	Low
Applicant's Proposed Action	91.9	26.7	26.1	39.1
Variation S1-B1	*6.4*	*6.2*	*0.1*	*0.1*
Variation S1-B2	*6.4*	*6.2*	*0.2*	*0.0*
East of Bombing Range Road	92.3	27.6	25.7	39.0
Applicant's Proposed Action – Southern Route	99.1	26.4	28.6	44.1
West of Bombing Range Road – Southern Route	95.6	33.1	29.7	32.8
Longhorn	88.2	27.9	25.4	34.9
Interstate 84	84.7	60.5	19.4	4.8
Variation S1-A1	*18.5*	*17.0*	*1.1*	*0.4*
Variation S1-A2	*18.5*	*0.0*	*7.8*	*10.7*
Interstate 84 – Southern Route	93.4	60.7	22.9	9.8

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Stationary Sensitive Viewing Platforms				
2-16 Lindsay Prairie Preserve				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Low	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
2-17 Boardman Research Natural Area - Bombing Range Road				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
2-20 Butter Creek Community				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	High	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Low	Not applicable	Not applicable	Not applicable
Longhorn	High	Not applicable	Not applicable	Not applicable

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
2-23 Wilson Lane Southeast				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	High	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	High	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
3-3 Blue Mountain Forest State Scenic Corridor–Interstate 84				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	Moderate	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
Longhorn	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
3-9 City of Hermiston				
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
3-12 Pilot Rock Community				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Low	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
3-16 Emigrant Springs State Heritage Area				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Low	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Low	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
3-20 McKay Creek National Wildlife Refuge–Boat Launch				
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable
Interstate 84	Low	Not applicable	Not applicable	Not applicable
3-21 McKay Creek National Wildlife Refuge–Spring Creek Road				
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable
Interstate 84	Low	Not applicable	Not applicable	Not applicable
3-24 Meacham Divide Nordic Skiing Area				
Applicant's Proposed Action	None	Not applicable	Not applicable	Not applicable
Variation S1-B1	*None*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*None*	*IV*	*Yes*	*0.0*
East of Bombing Range Road	None	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	None	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	None	Not applicable	Not applicable	Not applicable
Longhorn	None	Not applicable	Not applicable	Not applicable
Interstate 84	None	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	None	Not applicable	Not applicable	Not applicable
3-27 Oregon Trail Area of Critical Environmental Concern–Oregon Trail Road				
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
3-39 Community of Stanfield				
Interstate 84	Moderate	Not applicable	Not applicable	Not applicable
Variation S1-A1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
3-40 Community of Echo				
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Variation S1-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
3-41 City of Pendleton				
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Variation S1-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
4-4 Blue Mountain Crossing Sno–Park				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Moderate	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
Longhorn	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
4-5 Blue Mountain Forest State Scenic Corridor–Old Emigrant Hill Scenic Frontage Road				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S1-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	High	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	High	Not applicable	Not applicable	Not applicable
Longhorn	High	Not applicable	Not applicable	Not applicable
Interstate 84	High	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	High	Not applicable	Not applicable	Not applicable
4-6 Blue Mountain Forest State Scenic Corridor–Summit Rd (Exit 243)				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Low	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Low	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
4-32 Oregon Trail Interpretive Park Picnic Area				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Moderate	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
Longhorn	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
4-33 Blue Mountain Forest Double Parking Lot				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Moderate	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
Longhorn	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
4-40 Spring Creek U.S. Forest Service Campground				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S1-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	High	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	High	Not applicable	Not applicable	Not applicable
Longhorn	High	Not applicable	Not applicable	Not applicable
Interstate 84	High	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	High	Not applicable	Not applicable	Not applicable

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Linear Sensitive Viewing Platforms				
Interstate 82				
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
Interstate 84				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Moderate	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Not applicable	Not applicable
Longhorn	Moderate	Not applicable	Not applicable	Not applicable
Interstate 84	High	Not applicable	Not applicable	Not applicable
Variation S1-A1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	High	Not applicable	Not applicable	Not applicable
Lewis and Clark Scenic Byway				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Low	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Low	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
State Highway 244				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Low	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Low	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Interstate 84	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
State Highway 74				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	Low	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Low	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	High	Not applicable	Not applicable	Not applicable
Longhorn	Low	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	Low	Not applicable	Not applicable	Not applicable
State Highway 207				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	High	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	High	Not applicable	Not applicable	Not applicable
Longhorn	High	Not applicable	Not applicable	Not applicable
Interstate 84	High	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	High	Not applicable	Not applicable	Not applicable
U.S. Highway 395				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	High	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	High	Not applicable	Not applicable	Not applicable
Longhorn	High	Not applicable	Not applicable	Not applicable
Interstate 84	High	Not applicable	Not applicable	Not applicable
Variation S1-A1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	High	Not applicable	Not applicable	Not applicable
U.S. Forest Road 21				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S1-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	High	Not applicable	Not applicable	Not applicable

Table 3-417. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 1—Morrow-Umatilla

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Applicant's Proposed Action – Southern Route	High	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	High	Not applicable	Not applicable	Not applicable
Longhorn	High	Not applicable	Not applicable	Not applicable
Interstate 84	High	Not applicable	Not applicable	Not applicable
Interstate 84 – Southern Route	High	Not applicable	Not applicable	Not applicable

Table 3-418. Conformance with U.S. Forest Service Visual Quality Objectives for Visual Analysis Unit BA-011 Blue Mountain Forest in Segment 1—Morrow-Umatilla

Alternative Route	Visual Quality Objective	Conformance	Visual Quality Objectives Met by the B2H Project	Acres of Disturbance	Percent of Total Visual Quality Objective within Study corridor
Applicant's Proposed Action	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	114	1.3
	Modification	No	Maximum Modification	13	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0
Variation S1-B1	*Preservation*	*Not applicable*	*Not applicable*	*0*	*0.0*
	Retention	*No*	*Maximum Modification*	*12*	*0.2*
	Partial Retention	*No*	*Maximum Modification*	*114*	*1.3*
	Modification	*No*	*Maximum Modification*	*13*	*0.0*
	Maximum Modification	*Not applicable*	*Not applicable*	*0*	*0.0*
Variation S1-B2	*Preservation*	*Not applicable*	*Not applicable*	*0*	*0.0*
	Retention	*No*	*Maximum Modification*	*107*	*2.3*
	Partial Retention	*No*	*Maximum Modification*	*2*	*0.0*
	Modification	*Not applicable*	*Not applicable*	*0*	*0.0*
	Maximum Modification	*Not applicable*	*Not applicable*	*0*	*0.0*

Table 3-418. Conformance with U.S. Forest Service Visual Quality Objectives for Visual Analysis Unit BA-011 Blue Mountain Forest in Segment 1—Morrow-Umatilla

Alternative Route	Visual Quality Objective	Conformance	Visual Quality Objectives Met by the B2H Project	Acres of Disturbance	Percent of Total Visual Quality Objective within Study corridor
East of Bombing Range Road	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	114	1.3
	Modification	No	Maximum Modification	13	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0
Applicant's Proposed Action – Southern Route	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	114	1.3
	Modification	No	Maximum Modification	13	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0
West of Bombing Range Road to Southern Route	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	114	1.3
	Modification	No	Maximum Modification	13	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0
Longhorn	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	114	1.3
	Modification	No	Maximum Modification	13	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0
Interstate 84	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	114	1.3
	Modification	No	Maximum Modification	13	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0

Table 3-418. Conformance with U.S. Forest Service Visual Quality Objectives for Visual Analysis Unit BA-011 Blue Mountain Forest in Segment 1—Morrow-Umatilla

Alternative Route	Visual Quality Objective	Conformance	Visual Quality Objectives Met by the B2H Project	Acres of Disturbance	Percent of Total Visual Quality Objective within Study corridor
Variation S1-A1	*Preservation*	*Does not cross U.S. Forest Service Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Variation S1-A2	*Preservation*	*Does not cross U.S. Forest Service Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Interstate 84 – Southern Road	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	114	1.3
	Modification	No	Maximum Modification	13	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0

Applicant's Proposed Action Alternative

Effects on Landscape Character and Scenic Quality

Extending generally northwest to southeast, this alternative crosses large expanses of flat to rolling dry farming lands with occasional narrow agricultural valleys, before reaching higher elevations with steeply rolling, forested mountains. Because this alternative traverses large expanses of flat to rolling rangeland, most of the 11 VAUs visible within 5 miles of this alternative are rated as C scenic quality (Table 3-415). Of these VAUS, one VAU has an A scenic quality rating, and three have B scenic quality ratings. The VAU with an A scenic quality rating would not be located within the foreground of the B2H Project resulting in a low level of residual impact. The VAUs with a B scenic quality rating would generally be subjected to high levels of project contrast due to the B2H Project crossing steep forested terrain, resulting in high impacts in the visible foreground and moderate impacts in the visible middleground. From areas in which the B2H Project would be visible, these VAUs also would experience decreases to the scenic quality rating scores. The decreases in scores would not, however, result in changes in the overall rating of B scenic quality.

Variation S1-B1

Because this route variation follows the same alignment, though Link 1-77 as the Applicant's Proposed Action Alternative goes through rolling forested lands, the impacts would be the same.

Variation S1-B2

This route variation (Link 1-73) generally parallels an existing 230-kV H-frame transmission line to the north and east of the Applicant's Proposed Action Alternative through rolling forested lands. Compared to the Applicant's Proposed Action Alternative, the project contrast associated with this variation would be predominately codominant with the parallel existing transmission line with its associated clearings and access roads. For a simulation of the route variation, refer to Appendix H3.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The Design Option 1 would occur in a VAU with a Class C scenic quality, VAU BA-003 Longhorn, and would include a rebuilt 115-kV transmission line on the east side of Bombing Range Road. The rebuild transmission line would be slightly larger in scale than the existing structures but would not considerably lower the scenic quality within the area.

Design Option 2

The Design Option 2, like Design Option 1, would occur in the same VAU with a Class C scenic quality and would have similar visual impacts as Design Option 1.

Design Option 3

The Design Option 3, like Design Option 1 would occur in the same VAU with a Class C scenic quality, but would have higher visual impacts as Design Option 1 due to the new stepdown substation that would be approximately 2.5 miles from the B2H Project.

Effects on Views

Approximately 26.7 miles of high impacts and 26.1 miles of moderate impacts on views associated with residents, recreation, and travel routes would be associated with the Applicant's Proposed Action Alternative.

Effects on Residential Views

In general, the highest impacts on residential viewers would be concentrated in five different locations where residences are located from 0.25 mile to 0.5 mile of the route alignment. Near the I-84 corridor and Wilson Lane east of Boardman, Oregon, several residences would have continuous views of the alternative components in this flat to rolling agricultural landscape. Currently, these residences have views of existing 500-kV and 69-kV transmission lines; however, along this route, the B2H Project would be closer to the residences than the existing 500-kV line. In the vicinity of Butter Creek, and to the north and east of Pilot Rock City, several residences in each of these areas would experience unobstructed views of the B2H Project and structures within a flat to rolling agricultural landscapes. Several residences also are located in the McKay Creek area, where rolling mountains begin to rise above the narrower and deeply incised agricultural valleys. Views of the B2H Project from these residences would be partially obstructed by landforms but generally skylined in proximity where visible. In the Blue Mountains, a number of residences that are scattered throughout this partially to densely wooded landscape with steeply rolling hills. In this area, most views of the transmission line towers,

structures, and clearings would be partially to mostly obstructed by the tall evergreen vegetation within the landscape.

High impacts on residential stationary Sensitive Viewing Platforms would include those for Sensitive Viewing Platform 2-23 (Wilson Lane Southeast) and 2-20 (Butter Creek Community). Views from Sensitive Viewing Platform 2-23 would include continuous, skylined views of the alternative alignment in a flat agricultural landscape from a distance of approximately 0.2 mile dominating the viewshed. Views from Sensitive Viewing Platform 2-20 also would be dominated by inferior skylined views of the alternative alignment from within a shallow valley from a distance of approximately 0.2 mile.

Variation S1-B1

Because this route variation follows the same alignment as the Applicant' Proposed Action Alternative, through the steeply rolling forested landscape of the Blue Mountains Impacts would be the same throughout the Link 1-77. Views from residences in this area generally would be obstructed by evergreen forest vegetation, with the exception of one residence that is located south of the Blue Mountain Crossing Sno-Park. This residence lies within approximately 350 feet of the route variation near a clearing in the forest vegetation, and would have views dominated by transmission line structures, access roads, and right-of-way vegetation clearing.

Variation S1-B2

Only one residence is located within 0.5 mile of this route variation. Views of the route variation from this residence would be obstructed by vegetation.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Design Option 1 action would have minimal impacts on views from residences.

Design Option 2

Design Option 2 would have similar minimal impacts on views associated with residences as Design Option 1.

Design Option 3

Design Option 3 would have moderate impacts on a residence found off of Little Juniper Lane. This residence would have views of the stepdown substation that would be introduced into the view, including additional geometric forms approximately 3 miles away.

Effects on Recreational Views

Key impacts on views from stationary viewing platforms associated with recreation would include views from Sensitive Viewing Platform 2-17 (Boardman Research Natural Area), Sensitive Viewing Platform 4-4 (Blue Mountain Crossing Sno-Park), Sensitive Viewing Platform 4-40 (Spring Creek USFS Campground), Sensitive Viewing Platforms 4-5 and 4-6 (Blue Mountain State Scenic Corridor), Sensitive Viewing Platform 4-32 (Oregon Trail Interpretive Park Picnic Area), and Sensitive Viewing Platform 4-33 (Blue Mountain Forest Double Parking Lot). Impacts on views from Sensitive Viewing Platform 2-17 would be moderate because the Applicant's Proposed Action Alternative would replace

an existing wooden H-frame 69-kV line located along the west side of Bombing Range Road that has already modified the existing flat agricultural and grassland setting. Views from Sensitive Viewing Platforms 4-40 and 4-5 would experience high level of impacts associated with views of the B2H Project as it crosses through heavily forested lands from less than 0.25 mile away. The B2H Project components and right-of-way clearing would be clearly visible from a neutral viewing position at these viewing platforms, and introduce lines and forms that would contrast with existing landscape characteristics and be dominant elements within the landscape.

Impacts on views from Sensitive Viewing Platforms 4-32 and 4-33 would be partially obstructed by tall evergreen forest vegetation. Where visible from these locations, the transmission line towers would be skylined at a slightly inferior viewing angle from a distance of approximately 1 mile. Because the project alignment would pass these viewing platforms at a parallel orientation, views of the right-of-way would be screened from view, and the top half of each tower structure would be visible above the adjacent trees. The towers would be codominant in the landscape from these viewing positions, resulting in a moderate level of impact.

There would be minimal impacts on linear viewing platforms or SMAs that are associated with recreation.

Variation S1-B1

Impacts on views from stationary, linear, and SMAs for this route variation would be the same as those expected for the Applicant's Proposed Action Alternative for Link 1-77.

Variation S1-B2

For Sensitive Viewing Platform 2-17, impacts from stationary viewing platforms associated with this route variation would be the same as those expected for the Applicant's Proposed Action Alternative. Views from Sensitive Viewing Platforms 4-4 and 4-5 would be mostly obstructed by tall evergreen forest vegetation, resulting in low levels of impact.

Impacts on views from Sensitive Viewing Platforms 4-32 and 4-33 would be partially obstructed by tall evergreen forest vegetation. Where visible from these locations, the transmission line towers would be backdropped by existing wooded lands from a superior viewing angle at a distance of approximately 0.3 to 0.4 mile. Because the project alignment would pass these viewing platforms at a parallel orientation, views of the right-of-way would be screened from view, and the top half of each tower structure would be visible above the adjacent trees. The towers would be subordinate in the landscape from these viewing positions, resulting in a low level of impact. Viewing platforms 4-32 and 4-33 are part of USFS's Oregon Trail Interpretive Park at Blue Mountain Crossing, and are connected by a paved road that provides access to this area. This access road begins on the west side of I-84, and perpendicularly crosses eastward under I-84, the clearing of a pipeline right-of-way, and the right-of-way clearing and H-frame structures of an existing 230-kV transmission line before reaching these viewing locations. Simulation 4-32 provides a visualization of Variation S1-B2 where it is colocated with the existing 230-kV transmission line, and Simulation 4-33 provides a simulation of the parallel views of the B2H

project from a point along the access road approximately 0.1 mile southeast of Sensitive Viewing Platform 4-33 (where the project would also be colocated with the existing 230-kV transmission line).

Views of the B2H Project from Sensitive Viewing Platform 4-40 would be from a neutral viewing position, and would be partially obstructed by tall evergreen forest vegetation. The project alignment would be parallel to the viewer at a distance of approximately 0.1 mile. Based on the parallel alignment, views of the right-of-way would be screened from view, but top portions of nearby tower structures could be visible above the adjacent trees. If visible, the towers would be codominant in the landscape from these viewing positions, resulting in a moderate level of impact.

There would be minimal impacts on linear viewing platforms or SMAs that are associated with recreation.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

The new double-circuit 230-kV associated with Design Option 1 would slightly increase impacts on views from Sensitive Viewing Platform 2-17 but impacts would remain within the moderate threshold. These impacts would include views of a larger double-circuit 230-kV transmission line compared to the existing 69-kV line.

Design Option 2

Impacts on views from Sensitive Viewing Platform 2-17 would be similar to Design Option 1 except this option would route the rebuilt transmission line farther to the east as viewed from Sensitive Viewing Platform 2-17 resulting in reduced effects on these views.

Design Option 3

Impacts on views from Sensitive Viewing Platform 2-17 would be similar to Design Option 2 except this option is located farther to the east further reducing effects on views.

Effects on Views from Travel Routes

The highest impacts on travel routes would be associated with a crossing of I-84 east of Boardman; a crossing of State Highway 207; a crossing of U.S. Highway 395; and closely paralleling I-84 in the Blue Mountains. The crossing of I-84 east of Boardman would result in head-on views of the B2H Project as viewers approach the State Highway 730 interchange in both directions. However, existing views along I-84 in this area include views of existing 500-kV and 230-kV lines within 1.5 miles of the Applicant's Proposed Action Alternative. In Butter Creek Valley area, the route crosses State Highway 207 in an area where travelers on the highway would experience continuous, skylined views (both parallel and head-on) of the B2H Project in a flat to rolling agricultural landscape. The B2H Project would cross U.S. Highway 395 just north of Pilot Rock City, where travelers on the highway would experience head-on, skylined views of the alternative as it crosses the highway in an agricultural valley. Travelers on I-84 would experience intermittent, parallel views of the alternative to the west of the highway. These views would, however, be partially obstructed by topography and tall evergreen forest vegetation reducing the dominance of the B2H Project.

Variation S1-B1

Because this route variation follows the same alignment as the Applicant's Proposed Action Alternative in the vicinity of I-84, impacts would be the same.

Variation S1-B2

This route variation diverts from the alignment of the Applicant's Proposed Action Alternative in the vicinity of the I-84 corridor within the Blue Mountains, turning further east and crossing I-84 in two separate locations. Although this route variation is colocated with an existing H-frame 230-kV transmission line, travelers using the I-84 would be able to observe a wider transmission corridor and associated geometric right-of-way vegetation clearing. Additionally the B2H Project structures would be taller than the existing transmission line which would rise above the trees when adjacent to I-84. Therefore, a higher impact on viewers would be associated with Variation S1-B1 than the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

There would be no high or moderate impacts on viewers from travel routes due to distance.

Design Option 2

There would be no high or moderate impacts on viewers from travel routes due to distance.

Design Option 3

There would be no high or moderate impacts on viewers from travel routes due to distance.

Conformance with Management Objectives

If the Applicant's Proposed Action Alternative were selected, the B2H Project would conform to management objectives for BLM-administered lands. However, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs provided in Table 3-418 would include 12 acres of non-conformance with the Retention VQO; 108 acres of non-conformance with the Partial Retention VQO; and 13 acres of non-conformance with the Modification VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Variation S1-B1

Because this variation follows the same alignment through Link 1-77 in BA-011 Blue Mountain Forest VAU, the conformance with management objectives of the B2H Project associated with this route variation is the same as described for the Applicant's Proposed Action.

Variation S1-B2

Similar to the Applicant's Proposed Action Alternative, the B2H Project would conform with BLM management objectives of this route variation is selected. However, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. This occurrence would include 107 acres of non-conformance in the Retention VQO and 108 acres of non-conformance

in the Partial Retention VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The Design Options 1, 2, and 3 do not cross BLM- and USFS-administered lands.

East of Bombing Range Road Alternative

Effects on Landscape Character and Scenic Quality

Impacts on landscape character and scenic quality associated with this alternative would be similar to those described for the Applicant's Proposed Action Alternative. An exception would be where the B2H Project would be located along the east side of Bombing Range Road (rather than the west side of Bombing Range Road). Although the project contrast in this area would be moderate for both theses alternative routes, the level of impacts associated with the East of Bombing Range Alternative would be expected to be slightly lower because under this alternative the B2H Project would be an additional line to the existing single-pole transmission line on the east side of the Bombing Range Road, the Applicant's Proposed Action Alternative would replace a more visually intrusive H-frame transmission line on the west side of the Bombing Range Road.

Effects on Viewers

The East of Bombing Range Road Alternative would have 0.9 mile more of high impacts and 0.4 mile less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Viewers

Effects on residential viewers from the B2H Project under this alternative would be the similar to those associated with the Applicant's Proposed Action Alternative. If the B2H Project were located on the east side of Bombing Range Road (rather than on the west side of Bombing Range Road), the impacts on the concentration of residences located near the I-84 corridor and Wilson Lane would be similar to the impacts described for the Applicant's Proposed Action Alternative. Impacts on views from residential stationary Sensitive Viewing Platforms also would be similar to those described for the Applicant's Proposed Action Alternative.

Effects on Recreational Views

Impacts on views from stationary viewing platforms associated with recreation would be similar to those described for the Applicant's Proposed Action Alternative. An exception would be the views from Sensitive Viewing Platform 2-17 where the B2H Project components on the east side of Bombing Range Road would be visible in addition to the existing wood H-frame 69-kV line on the west side of the road resulting in high impacts.

There would be minimal impacts on linear viewing platforms or SMAs that are associated with recreation.

Effects on Views from Travel Routes

Impacts on viewers from travel routes associated with this alternative would be similar to those described for the Applicant's Proposed Action Alternative.

Conformance with Management Objectives

If the East of Bombing Range Road Alternative is selected, the B2H Project would conform to management objectives established for BLM-administered lands. However, similar to the Applicant's Proposed Action Alternative, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs established in the Table 3-418 would include 12 acres of non-conformance with the Retention VQO; 108 acres of noncompliance within the Partial Retention VQO; and 13 acres of non-conformance within the Modification VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Applicant's Proposed Action – Southern Route Alternative

Effects on Landscape Character and Scenic Quality

Impacts on landscape character and scenic quality associated with the Applicant's Proposed Action – Southern Route Alternative would be similar for approximately 73 miles to those described for the Applicant's Proposed Action Alternative. An exception is that this route extends south of the community of Pilot Rock (rather than to the north), would increase the overall length approximately 7 miles longer of the B2H Project through flat to steeply rolling lands that are mostly undeveloped. The greater number of miles across undeveloped lands would result in more miles of high impacts on landscape character and scenic quality than the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Similar to the Applicant's Proposed Action Alternative, Design Option 1 would occur in a VAU with a Class C scenic quality, and would include a rebuilt 115-kV transmission line on the east side of Bombing Range Road. The rebuild transmission line would be slightly larger in scale than the existing structures but would not considerably lower the scenic quality within the area.

Design Option 2

The Design Option 2, like Design Option 1 would occur in the same VAU with a Class C scenic quality, VAU BA-003 Longhorn and would have similar visual impacts as Design Option 1.

Design Option 3

The Design Option 3, like Design Option 1 would occur in the same VAU with a Class C scenic quality, VAU BA-003 Longhorn and would have similar visual impacts as Design Option 1.

Effects on Viewers

The Applicant's Proposed Action – Southern Route Alternative would have 0.3 mile less of high impacts and 2.5 miles more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Approximately 26.4 miles of high impacts, 0.3 less than the Applicant's Proposed Action Alternative and 28.6 miles of moderate impacts, 2.5 miles more than the Applicant's Proposed Action Alternative, on views associated with residents, recreation, and travel routes would be associated with the Applicant's Proposed Action – Southern Route Alternative.

Effects on Residential Viewers

Effects on residential viewers from the B2H Project associated with this alternative would be similar as those described for the Applicant's Proposed Action Alternative as the two alternative routes share much of the same alignment. However, under this alternative, the B2H Project would turn further to the south and be located several miles from the residences in the Pilot Rock City area, as well as several residences within the McKay Creek Valley. This would cause the impacts to be lower due to less residential views being affected. Impacts on the views from these residences would be low because the views would be from distances of approximately 3 miles, and would be partially to fully obstructed by existing landforms. The B2H Project would be visible from several homes in the Birch Creek Valley and from a different residence in the McKay Creek Valley than the Applicant's Proposed Action Alternative. In the vicinity of these two valleys, rolling mountains begin to rise above these increasingly narrower and deeply incised agricultural valleys. Views of the B2H Project components from these residences would be partially obstructed by landforms but generally skylined and in proximity where visible.

Impacts on residential stationary Sensitive Viewing Platforms associated with the Applicant's Proposed Action – Southern Route Alternative would be less than those described for the Applicant's Proposed Action Alternative due to the section of the route that travels south of Pilot Rock.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Similar to the Applicant's Proposed Action Alternative, Design Option 1 would have minimal impacts on views from residences.

Design Option 2

Design Option 2 would have similar minimal impacts on views associated with residences as Design Option 1.

Design Option 3

Design Option 3 would have moderate impacts on a residence found off of Little Juniper Ln. This residence would have views of the stepdown substation that would be introduced to views associated with this residence approximately 3.0 miles away.

Effects on Recreational Viewers

Impacts on views from stationary viewing platforms associated with recreation associated with the Applicant's Proposed Action – Southern Route Alternative would be the same as those described for the Applicant's Proposed Action Alternative. Although the Applicant's Proposed Alternative Action is closer to Sensitive Viewing Platforms 3-20 and 3-21 at a distance of approximately 2.5 miles, the impacts from both alternative routes on recreational views are low.

There would be minimal impacts on linear viewing platforms or SMAs that are associated with recreation.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Similar to the Applicant's Proposed Action Alternative, the new double-circuit 230-kV associated with Design Option 1 would slightly increase impacts on Sensitive Viewing Platform 2-17, though impacts would remain within the moderate threshold. These impacts would be associated with views of new transmission line structures that would be larger in scale (existing 69-kV structures as compared to new double-circuit 230-kV structures).

Design Option 2

Impacts on Sensitive Viewing Platform 2-17 would be similar to those discussed for Design Option 1, as the impacts would include the slightly larger transmission line from the new double-circuit 230-kV. Impacts associated with Design Option 2 would be slightly less than those associated with Design Option 1 because the proposed transmission line would affect a longer length of Sensitive Viewing Platform 2-17.

Design Option 3

Impacts on Sensitive Viewing Platform 2-17 would be similar to those discussed for Design Option 2, as the impacts would include the slightly larger transmission line from the new double-circuit 230-kV. Impacts associated with Design Option 3 would be slightly less than those associated with Design Option 2 because the proposed transmission line would affect a longer length of Sensitive Viewing Platform 2-17.

Effects on Viewers from Travel Routes

Impacts on views from travel routes associated with this alternative would be similar to those associated with the Applicant's Proposed Action Alternative, with the exception of the State Highway 395 crossing of this alternative through a mostly undeveloped area rather than through agricultural land. Travelers on this travel route would experience skylined, head-on views of the alternative to the southwest of Pilot Rock City, within an enclosed valley resulting in high impacts

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

There would be no high or moderate impacts on viewers from travel routes due to distance.

Conformance with Management Objectives

Similar to the Applicant's Proposed Action Alternative, the B2H Project would conform with BLM management objectives if this alternative route is selected. However, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. This occurrence would include 12 acres of non-conformance in the Retention VQO; 108 acres of non-conformance in the Partial Retention VQO; and 13 acres of non-conformance in the Modification VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The Design Options 1, 2, and 3 do not cross BLM and USFS-administered lands..

West of Bombing Range Road – Southern Route Alternative

Effects on Landscape Character and Scenic Quality

Similar to the Applicant's Proposed Action Alternative, this route extends generally northwest to southeast, crossing large expanses of flat to steeply rolling lands with occasional narrow agricultural valleys before reaching higher elevations with steeply rolling, forested mountains. Under this alternative, the B2H Project would extend further to the south than the Applicant's Proposed Action Alternative, crossing rolling hills and drainages that are less developed; thus, resulting in additional area of high impacts. Although impacts on VAUs would be similar to those of the Applicant's Proposed Action Alternative, the West of Bombing Range Road – Southern Route Alternative would have a greater degree of impact on mostly undeveloped landscapes.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Similar to the Applicant's Proposed Action Alternative, Design Option 1 would occur in a VAU with a Class C scenic quality, and would include a rebuilt 115-kV transmission line on the east side of Bombing Range Road. The rebuild transmission line would be slightly larger in scale than the existing structures but would not considerably lower the scenic quality within the area.

Design Option 2

The Design Option 2, like Design Option 1 would occur in the same VAU with a Class C scenic quality, VAU BA-003 Longhorn and would have similar visual impacts as Design Option 1.

Design Option 3

The Design Option 3, like Design Option 1 would occur in the same VAU with a Class C scenic quality, VAU BA-003 Longhorn and would have similar visual impacts as Design Option 1.

Effects on Viewers

The West of Bombing Range Road – Southern Route Alternative would have 6.4 miles more of high impacts and 3.6 miles more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Viewers

Impacts on residential viewers from the B2H Project under this alternative would be same as those described for the Applicant's Proposed Action Alternative near the I-84 corridor, Wilson Lane east of Boardman, and in the Blue Mountains. Several residences near the I-84 corridor and Wilson Lane would have continuous views of the B2H Project components in this flat to rolling agricultural landscape where existing 500-kV and 69-kV transmissions lines are visible but due to the proximity of the B2H Project, high impacts are anticipated. Similar to the Applicant's Proposed Action Alternative, impacts on residential viewers in the Blue Mountains would affect a number of residences scattered throughout this

partially to densely wooded landscape with steeply rolling hills. Most views of the B2H Project structures and clearings would be partially to mostly obstructed by the tall evergreen vegetation within the landscape.

Impacts on residential viewers from the B2H Project would vary from the Applicant's Proposed Action Alternative where the B2H Project would extend further southward through less developed rolling hills and drainages. More miles of high impacts on residential viewers (approximately 25 versus 23 miles) would be anticipated but fewer residences would be affected (due to greater distance between the B2H Project and the more populated area of Pilot Rock City).

Impacts on viewers from residential stationary Sensitive Viewing Platforms would be similar to those described for the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Similar to the Applicant's Proposed Action Alternative, Design Option 1 would have minimal impacts on views from residences.

Design Option 2

Design Option 2 would have similar minimal impacts on views associated with residences as Design Option 1.

Design Option 3

Design Option 3 would have moderate impacts on a residence found off of Little Juniper Lane. This residence would have views of the stepdown substation that would be introduced to views associated with this residence approximately 3.0 miles away.

Effects on Recreational Viewers

Impacts on views from stationary viewing platforms associated with recreation along the West of Bombing Range Road – Southern Route Alternative would be similar to those described for the Applicant's Proposed Action Alternative. An exception would be moderate impacts on views from Sensitive Viewing Platform 2-16 (Lindsay Prairie Preserve) where the B2H Project components would be skylined and continuously visible within a flat to rolling agricultural landscape.

There would be minimal impacts on linear viewing platforms or SMAs that are associated with recreation.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Similar to the Applicant's Proposed Action Alternative, the new double-circuit 230-kV associated with Design Option 1 would slightly increase impacts on Sensitive Viewing Platform 2-17, though impacts would remain within the moderate threshold. These impacts would partially include a larger transmission line, from the existing 69-kV line to a new double-circuit 230-kV line as well as a visible structure.

Design Option 2

Impacts on Sensitive Viewing Platform 2-17 would similar to Design Option 1 as the impacts would still include the slightly larger transmission line from the new double-circuit 230-kV yet would sooner leave the views from Sensitive Viewing Platform 2-17 as the transmission line varies off to the east.

Design Option 3

Impacts on Sensitive Viewing Platform 2-17 would be similar yet would sooner leave the views from Sensitive Viewing Platform 2-17 as the transmission line varies off to the east further than Design Option 2.

Effects on Views from Travel Routes

Impacts on views from travel routes would be the similar as those described for the Applicant's Proposed Action Alternative where the B2H Project would cross I-84 east of Boardman and parallel I-84 in the Blue Mountains. The B2H Project along this alternative would cross State Highway 207 and U.S. Highway 395 in different locations than the Applicant's Proposed Action Alternative as well as an additional crossing of State Highway 74. The alignment for this alternative crosses State Highway 207 several miles west of Butter Creek, where travelers on the highway would experience continuous, head-on, skylined views of the B2H Project components in a flat agricultural landscape resulting in high impacts on these views. The route crosses U.S. Highway 395 several miles south of Nye, Oregon, where travelers on the highway also would experience head-on, skylined views of the alternative as it crosses the highway in a flat to rolling agricultural landscape resulting in high impacts on these views. Travelers on State Highway 74 would experience high impacts resulting from the B2H Project due to skylined, head-on and parallel views of the alternative within a rolling grassland landscape used primarily for grazing.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

There would be no high or moderate impacts on viewers from travel routes due to distance.

Conformance with Management Objectives

Similar to the Applicant's Proposed Action Alternative, the B2H Project would conform with BLM management objectives if this alternative route is selected. However, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. These occurrences would include 12 acres of non-conformance in the Retention VQO; 108 acres of non-conformance in the Partial Retention VQO; and 13 acres of non-conformance in the Modification VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

The Design Options 1, 2, and 3 would be in conformance with BLM and USFS management objectives for visual resources.

Longhorn Alternative

Effects on Landscape Character and Scenic Quality

Extending generally northwest to southeast, this alternative begins by crossing I-84 followed by crossing through irrigated farmland and tree farms several miles east of Bombing Range Road. In comparison to the Applicant's Proposed Action Alternative, the vertical form of the tree farms would be more similar in scale to the transmission line towers than the flat dry range lands and irrigated farming lands that the Applicant's Proposed Action Alternative would traverse. Although the degree of project contrast would be moderate for both alternatives within this area, this alternative would have a lesser degree of impact on area's scenic quality. Approximately 4 miles west of Butter Creek the Longhorn Alternative intersects the alignment of the Applicant's Proposed Action Alternative, and follows the same alignment with the same impacts on the scenic quality in those areas.

Effects on Viewers

The Longhorn Alternative would have 1.2 miles more of high impacts and 0.7 mile less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects Associated with Residents

Impacts associated with residential viewers would be the same as those of the Applicant's Proposed Action Alternative for most of the length of the variation except for the northeastern most portion of this alternative, where the Longhorn Alternative separates from the Applicant's Proposed Action Alternative and crosses through irrigated farmland and tree farms several miles east of Bombing Range Road. This alignment would result in a lesser degree of impacts on the residences near the I-84 corridor and Wilson Lane east of Boardman, but would result in high impacts on two residences within the irrigated farming and tree farming area. In this area the existing 500-kV lines are not visible; therefore the B2H Project would dominate these views as the setting is more intact

High impacts on residential stationary Sensitive Viewing Platforms would include those for Sensitive Viewing Platform 2-20 (Butter Creek Community). Views from this Sensitive Viewing Platform would be dominated by inferior skylined views of the alternative alignment from within a shallow valley from a distance of approximately 0.25 mile.

Effects on Recreational Viewers

Impacts from stationary viewing platforms associated with recreation would be similar to those of the Applicant's Proposed Action Alternative, with the exception that there would be no identifiable impacts associated with Sensitive Viewing Platform 2-17 or Sensitive Viewing Platform 2-16.

There would be no considerable impacts on linear viewing platforms or SMAs that are associated with recreation.

Effects on Views from Travel Routes

Impacts on viewers using travel routes would be the similar as those associated with the Applicant's Proposed Action Alternative, with the exception that the Longhorn Alternative's crossing of I-84 east of

Boardman would occur approximately 1.5 miles further east than that of the Applicant's Proposed Action Alternative. The level of impact associated with this crossing would not, however, differ from those of the Applicant's Proposed Action Alternative. This alternative would also affect the Sensitive Linear Platform State Highway 207 for a shorter duration.

Conformance with Management Objectives

The Longhorn Alternative would conform with management objectives for BLM-administered land. However, there would be areas of non-conformance on USFS-administered lands, in the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs provided in Table 3-418 would include 12 acres of non-conformance with the Retention VQO, 108 acres of noncompliance within the Partial Retention VQO, and 13 acres of non-conformance within the Modification VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Interstate 84 Alternative and Variations

Effects on Landscape Character and Scenic Quality

Extending generally northwest to southeast, this alternative generally follows the I-84 corridor eastward before turning southward just west of Pendleton, Oregon. The alternative continues southward to a point northeast of Pilot Rock City, from which point it follows the same alignment as the Applicant's Proposed Action Alternative southeastward into higher elevations with steeply rolling, forested mountains. In comparison to the Applicant's Proposed Action Alternative, the Interstate 84 Alternative would have lesser amounts of strong project contrast—based on its alignment with the I-84 corridor in lieu of the mostly undeveloped dry farming and range lands crossed by the Applicant's Proposed Action Alternative.

Most of the 11 VAUs visible within 5 miles of this alternative are rated as C scenic quality. Of these VAUs, one has an A scenic quality rating, and three have B scenic quality ratings. The VAU with A scenic quality rating is not within the foreground of this alternative, and would experience a low level of impact. The VAUs with B scenic quality would generally experience strong levels of project contrast, resulting in high impacts within the visible foreground and moderate impacts within the visible middleground. These impacts would result in decreases to the scenic quality rating scores, but would not result in changes in the overall rating of B scenic quality.

Variation S1-A1

This route variation follows the same alignment as the Interstate 84 Alternative, follows the I-84 corridor and then turns southward west of Pendleton, Oregon to a point just south of the Umatilla River Valley. The B2H Project contrast associated with this variation would generally be moderate.

Variation S1-A2

This route variation is colocated with an existing 230-kV wood H-frame transmission line to the south of the Interstate 84 Alternative, crossing the Umatilla River Valley and continuing eastward along the southern edge of the Umatilla River Valley—before rejoining the Interstate 84 Alternative just south of the Umatilla River Valley. Although the B2H Project contrast associated with this variation would be

lower due to its parallel alignment with an existing transmission line, it would have higher impacts on a VAU with B scenic quality (BA-032 Umatilla River).

Effects on Viewers

The Interstate 84 Alternative would have 33.8 miles more of high impacts and 6.7 miles less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects Associated with Residents

Impacts on views from residences associated with this alternative would be high along the I-84 corridor, where the alignment would pass through rural areas that are generally more populated than the lands to the south of the highway. The Interstate 84 Alternative would include more high impacts (42.4 miles) to residential viewers than any other alternative within Segment 1. This alternative would intersect with the alignment of the Applicant's Proposed Action Alternative to the northwest of Pilot Rock City, and follow the same alignment to the southeast for the remainder of this Segment. Impacts on views from residences would therefore be the same as described for the Applicant's Proposed Action Alternative south and east of Pilot Rock City, in the areas near McKay Creek area, and within the Blue Mountains.

This alternative would include minimal impacts on residential Sensitive Viewing Platforms.

Variation S1-A1

This variation follows the same alignment through Link 1-31 as the Interstate 84 Alternative along the I-84 corridor before turning southward at a point several miles west of Pendleton, Oregon. As compared to Variation S1-A2, this alignment would include a greater number of high impacts on residences (6.8 miles) This would affect the foreground of more than twice as many residential views.

Variation S1-A2

As compared to Variation S1-A1, this alignment along Link 1-37 would include a lesser number of high impacts on residences (0.9 mile) and would affect a lesser number of residences. Views from residences in this area would generally be located within the Umatilla River Valley, where this variation would be seen colocated with an existing 230-kV wood H-frame transmission line.

Effects on Recreational Viewers

Although this alternative is approximately 7.2 miles shorter than the Applicant's Proposed Alternative Action, impacts from stationary viewing platforms associated with recreation would be similar to those of the Applicant's Proposed Action Alternative, except that there would be no identifiable impacts associated with Sensitive Viewing Platform 2-17 for this alternative.

There would be minimal impacts on linear viewing platforms or SMAs associated with recreation.

Variation S1-A1

Impacts from stationary viewing platforms associated with recreation would be the same as those described for the Interstate 84 Alternative throughout Link 1-31.

There would be minimal impacts on linear viewing platforms or SMAs associated with recreation.

Variation S1-A2

Impacts on stationary viewing platforms associated with recreation would be the very similar as those described for the Interstate 84 Alternative; however, this variation is colocated with a 230-kV transmission line.

There would be minimal impacts on linear viewing platforms or SMAs associated with recreation.

Effects on Views from Travel Routes

Impacts on the I-84 travel route would be particularly high for this alternative, as the alternative alignment crosses and then closely parallels I-84 for approximately 35 miles through a flat agricultural landscape with relatively few large-scale transmission lines (three existing 69-kV crossings and one existing 230-kV crossing), and no large-scale transmission lines that currently parallel the interstate. Travelers along I-84 would experience brief head-on views where the alternative alignment crosses I-84, followed by approximately 35 miles of parallel views of the alternative alignment on the south side of the roadway. The Interstate 84 Alternative would generally be located within 0.5 mile of I-84, resulting in impacts that are predominately high. Two other travel routes, Interstate-82 and U.S. Highway 395, intersect I-84 via traffic interchanges where the Interstate 84 Alternative would parallel I-84. This occurs in areas where the existing 69-kV and/or 230-kV lines are already visible with 0.5 to 0.75 mile in the flat to rolling agricultural landscape. This Interstate 84 Alternative also crosses State Highway 207 on the south side of its traffic interchange with I-84, where impacts would be high and travelers would experience skylined, head-on views of the B2H Project components. Impacts on travel routes would be the same as those for the Applicant's Proposed Action Alternative for the crossing of U.S. Highway 395 north of Pilot Rock City and the close parallel alignment with I-84 in the Blue Mountains.

Variation S1-A1

Impacts on travel routes for this variation would be the same as those described for the Interstate 84 Alternative.

Variation S1-A2

Impacts on travel routes for this variation would be less than those associated with Variation S1-A1 because this variation alignment would veer away from the I-84 corridor to the south.

Conformance with Management Objectives

The Interstate 84 Alternative would conform with management objectives established for BLM-administered lands. However, there would be areas of non-conformance on USFS lands in the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs provided in Table 3-21 would include 12 acres of non-conformance with the Retention VQO, 108 acres of noncompliance within the Partial Retention VQO, and 13 acres of non-conformance within the Modification VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Variations S1-A1 and S1-A2

These variations do not cross BLM- and USFS-administered lands.

Interstate 84 – Southern Route Alternative

Effects on Landscape Character and Scenic Quality

Potential effects from this alternative would be similar to those of the Interstate 84 Alternative, except that this alternative would extend to the south of Pilot Rock City (following a similar alignment in this area to the Applicant's Proposed Action – Southern Route Alternative). The Interstate 84 – Southern Route Alternative's southward extension would increase the overall length of the B2H Project by approximately 1.5 miles, and traverse approximately 3 more miles of Class B Landscapes reflected as flat to steeply rolling lands that are mostly undeveloped. This increase in miles of undeveloped lands crossed also would result in more miles of high impacts on landscape character and scenic quality than the Interstate 84 Alternative.

Effects on Viewers

The Interstate 84 – Southern Route Alternative would have 34.0 miles more of high impacts and 3.2 miles less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects Associated with Residents

Impacts on residents would be particularly high along the I-84 corridor, where the alignment would pass through rural areas that are generally more populated than the lands to the south of the highway. This alternative would include the second highest amount of high impacts (41.0 miles) to residential viewers as compared with the other alternatives within Segment 1. Effects on residential viewers from this alternative would generally be the same as those associated with the Interstate 84 Alternative, except that the alignment would extend southward around most of the residences in the Pilot Rock City area, and several residences within the McKay Creek Valley. This alignment would instead be visible from several homes within the Birch Creek Valley, and a residence within the McKay Creek Valley. In the vicinity of both valleys, rolling mountains begin to rise above increasingly narrow and deeply incised agricultural valleys. Views of the B2H Project components from these residences would be partially obstructed by landforms, but generally skylined and in proximity to the residences where visible.

This alternative would include minimal impacts on stationary viewing platforms related to residences.

Effects on Recreational Viewers

Impacts on stationary viewing platforms associated with recreation would be the same as those described for the Interstate 84 Alternative.

There would be minimal impacts on linear viewing platforms or SMAs that are associated with recreation.

Effects on Views from Travel Routes

Impacts on the I-84 travel route would be particularly high, as this alignment crosses and then closely parallels I-84 for approximately 35 miles through a flat agricultural landscape with relatively few large-scale transmission lines (three existing 69-kV crossings and one existing 230-kV crossing), and no large-scale transmission lines that currently parallel the interstate. Those traveling along I-84 would

experience brief head-on views where the alternative alignment crosses I-84, followed by approximately 35 miles of parallel views of the alternative alignment on the south side of the roadway. The Interstate 84 – Southern Route Alternative would generally be located within 0.5 mile of I-84, resulting in impacts that are primarily high. In addition, Interstate-82 and U.S. Highway 395 both join I-84 via traffic interchanges where the alternative route would parallel I-84, albeit in areas where existing 69-kV and/or 230-kV lines are already visible with 0.5 to 0.75 mile in this flat to rolling agricultural landscape. This alternative alignment also crosses State Highway 207 on the south side of its traffic interchange with I-84, where impacts would be high and travelers would experience skylined, head-on views of the B2H Project components. Impacts on travel routes would be the same as those for the Applicant's Proposed Action-Southern Route Alternative for the crossing of U.S. Highway 395 southwest of Pilot Rock City and the close parallel alignment with I-84 in the Blue Mountains.

Conformance with Management Objectives

The Interstate 84 – Southern Route Alternative would conform with management objectives established for BLM-administered lands. However, there would be areas of non-conformance on lands administered by the USFS, occurring within the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs established in Table 3-418 would include 12 acres of non-conformance with the Retention VQO, 108 acres of noncompliance within the Partial Retention VQO, and 13 acres of non-conformance within the Modification VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Conclusions

Impacts associated with the alternatives and variations in Segment 1 vary based on the types of effects being considered (e.g. landscape character and scenic quality, types of viewers, and conformance with management objectives). Alternatives in Segment 1 generally either extend south of the I-84 corridor (Applicant's Proposed Action Alternative, East of Bombing Range Road, Applicant's Proposed Action – Southern Route, West of Bombing Range Road – Southern Route, and Longhorn alternatives), or follow the I-84 corridor (Interstate 84 Interstate 84 – Southern Route alternatives). The two alternatives that follow I-84 would result in lower impacts on landscape character and scenic quality because these alternatives would traverse agricultural and ranching landscapes that include a higher degree of existing cultural modifications to the landscape than the alternatives that extend south of the interstate. Of the two alternatives that follow I-84, the Interstate 84 Alternative would result in lower impacts on landscape character and scenic quality. While the Variation S1-A2 would be collocated with an existing 230-kV transmission line, it would result in higher impacts on lands with a higher degree of scenic quality (VAU BA-032 Umatilla River). Near the southern end of Segment 1, Variation S1-B2 is collocated with an existing 230-kV transmission line.

Impacts on viewers would be higher for the alternatives that follow the I-84 corridor because I-84 is a major travel corridor, and because there are a higher number of residential viewers that would be affected in that area. Effects on viewers would be lowest for both the Applicant's Proposed Action – Southern Route and West of Bombing Range Road to Southern Route alternatives. Although the Applicant's Proposed Action – Southern Route Alternative would affect a greater number of views from

residents, the West of Bombing Range Road to Southern Route Alternative would affect views from an additional travel route.

Segment 1 also includes alternative routes and variations that would result in non-conformance with VQOs on lands managed by the USFS. The only differences in amount of non-conforming acres would occur between Variations S1-B1 and S1-B2. Variation S1-B1 would have a slightly greater number of non-conforming acres.

SEGMENT 2—BLUE MOUNTAINS

The impacts associated with each alternative and route variation in Segment 2 are described in this section. Supporting information is presented in Table 3-419, Table 3-420, Table 3-421, and Table 3-422. Table 3-420 presents the scenic quality impacts by VAU for each alternative route and route variation within Segment 2, including the acreage within the foreground and middleground of each VAU with views of the B2H Project. The existing scenic quality rating of each VAU also is included in this table, along with the residual scenic quality rating and score for both the foreground and middleground acreage. These residual scenic quality scores are based on the amount of change in score anticipated based on the criteria presented in Table 3-420. Information on potential impacts on viewers is represented in Table 3-419and Table 3-421. More specifically, Table 3-419 presents an overall comparison of impacts on viewers by alternative route and route variation, as measured in miles of high, moderate, and low impacts. The mileages of impacts are associated with the impacts as they relate back to the alignment of each alternative in Segment 2. This table also includes the total mileage of each alignment. Table 3-421 presents impacts on Sensitive Viewing Platforms, along with information regarding conformance with BLM VRM objectives for BLM-related Sensitive Viewing Platforms within Segment 2 Each assessment of conformance also is accompanied by the length of the alternative that can be viewed crossing the associated BLM VRM Class(es).

Conformance with USFS VQOs is presented in Table 3-422. These determinations are based on the expected degree of impact on the landscape character within VAU BA-011 (Blue Mountains Forest), which is the only VAU with USFS lands crossed by the B2H Project in Segment 2. The determinations of conformance with USFS VQOs are based on the criteria provided in Table 3-422.

At the end of this section is a conclusion of the impacts on Segment 2, which provides an overview of impacts as well as to which alternative routes and/or variations would be preferable. Because there are several facets to consider when analyzing potential impacts on visual resources (e.g. landscape character and scenic quality, viewers, and plan conformance), this overview provides preferences associated with each of those facets.

Table 3-419. Residual Impacts on Viewers for Segment 2—Blue Mountains				
Alternative Route	**Total Length (miles)**	**Residual Impacts (miles)**		
		High	**Moderate**	**Low**
Applicant's Proposed Action	33.8	17.5	15.5	0.8
Variation S2-A1	*2.8*	*2.5*	*0.3*	*0.0*
Variation S2-A2	*2.9*	*0.8*	*1.9*	*0.2*
Variation S2-B1	*3.7*	*1.1*	*2.3*	*0.3*
Variation S2-B2	*3.8*	*0.8*	*1.8*	*1.2*
Variation S2-C1	*9.3*	*1.9*	*7.4*	*0.0*
Variation S2-C2	*8.8*	*6.1*	*2.7*	*0.0*
Variation S2-D1	*2.3*	*0.0*	*2.3*	*2.0*
Variation S2-D2	*2.6*	*0.0*	*1.5*	*2.6*
Variation S2-E1	*12.1*	*1.7*	*0.6*	*0.0*
Variation S2-E2	*12.2*	*1.8*	*0.8*	*0.0*
Glass Hill	33.7	15.7	12.4	5.6
Variation S2-F1	*4.3*	*7.2*	*4.4*	*0.5*
Variation S2-F2	*4.1*	*1.3*	*6.3*	*4.6*
Mill Creek	34.0	12.4	15.9	5.7

Table 3-420. Scenic Quality Impacts by Visual Analysis Unit for Segment 2—Blue Mountains								
Alternative Route	**Acres Visible**		**Existing Scenic Quality Class (Rating)**	**Residual Impact Level**		**Residual Scenic Quality Class (Rating)**		**Total Change in Scenic Quality Rating (in acres)**
	Foreground	**Middleground**		**Foreground**	**Middleground**	**Foreground**	**Middleground**	
BA-011 Blue Mountain Forest								
Applicant's Proposed Action	13,025	94,339	B (15.0)	High	Low	B (13.5)	B (15.0)	13,025
Variation S2-A1	*2,122*	*43,786*	*B (15.0)*	*High*	*Low*	*B (13.5)*	*B (15.0)*	*2,122*
Variation S2-A2	*2,194*	*43,919*	*B (15.0)*	*High*	*Low*	*B (13.5)*	*B (15.0)*	*2,194*
Variation S2-B1	*2,471*	*50,980*	*B (15.0)*	*High*	*Low*	*B (13.5)*	*B (15.0)*	*2,471*
Variation S2-B2	*2,562*	*50,820*	*B (15.0)*	*High*	*Low*	*B (13.5)*	*B (15.0)*	*2,562*
Variation S2-C1	*6,423*	*61,842*	*B (15.0)*	*High*	*Moderate*	*B (13.5)*	*B (14.0)*	*68,265*
Variation S2-C2	*6,123*	*58,895*	*B (15.0)*	*High*	*Moderate*	*B (13.5)*	*B (14.0)*	*65,018*
Variation S2-E1	*1,585*	*28,187*	*B (15.0)*	*Moderate*	*Low*	*B (14.0)*	*B (15.0)*	*1,585*
Variation S2-E2	*1,421*	*28,350*	*B (15.0)*	*Moderate*	*Low*	*B (14.0)*	*B (15.0)*	*1,421*
Variation S2-F1	*387*	*21,055*	*B (15.0)*	*Moderate*	*Low*	*B (14.0)*	*B (15.0)*	*387*
Variation S2-F2	*314*	*21,089*	*B (15.0)*	*Moderate*	*Low*	*B (14.0)*	*B (15.0)*	*314*

Table 3-420. Scenic Quality Impacts by Visual Analysis Unit for Segment 2—Blue Mountains								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Glass Hill	13,179	94,213	B (15.0)	High	Low	B (13.5)	B (15.0)	13,179
Variation S2-D1	*3,275*	*53,296*	*B (15.0)*	*Moderate*	*Low*	*B (14.0)*	*B (15.0)*	*3,275*
Variation S2-D2	*3,133*	*53,196*	*B (15.0)*	*Moderate*	*Low*	*B (14.0)*	*B (15.0)*	*3,133*
Mill Creek	10,663	88,303	B (15.0)	High	Low	B (13.5)	B (15.0)	10,663
BA-012 Grand Ronde Valley								
Applicant's Proposed Action	0	12,740	C (8.5)	No change	Low	C (8.5)	C (8.5)	0
Variation S2-A1	*Not applicable*							
Variation S2-A2	*Not applicable*							
Variation S2-B1	*Not applicable*							
Variation S2-B2	*Not applicable*							
Variation S2-C1	*0*	*12,719*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S2-C2	*0*	*17,338*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S2-E1	*0*	*3,765*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S2-E2	*0*	*4,320*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S2-F1	*0*	*590*	*C (8.5)*	*No change*	*No change*	*C (8.5)*	*C (8.5)*	*0*
Variation S2-F2	*0*	*590*	*C (8.5)*	*No change*	*No change*	*C (8.5)*	*C (8.5)*	*0*
Glass Hill	0	9,347	C (8.5)	No change	Low	C (8.5)	C (8.5)	0
Variation S2-D1	*0*	*6,462*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S2-D2	*0*	*4,869*	*C (8.5)*	*No change*	*No change*	*C (8.5)*	*C (8.5)*	*0*
Mill Creek	341	28,178	C (8.5)	Moderate	Low	C (7.5)	C (8.5)	341
BA-013 Wallowa Mountains								
Applicant's Proposed Action	0	2,029	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
Variation S2-A1	*Not applicable*							
Variation S2-A2	*Not applicable*							
Variation S2-B1	*Not applicable*							
Variation S2-B2	*Not applicable*							
Variation S2-C1	*Not applicable*							
Variation S2-C2	*Not applicable*							
Variation S2-E1	*Not applicable*							
Variation S2-E2	*Not applicable*							
Variation S2-F1	*0*	*2,029*	*B (18.0)*	*No change*	*Low*	*B (18.0)*	*B (18.0)*	*0*
Variation S2-F2	*0*	*2,912*	*B (18.0)*	*No change*	*Low*	*B (18.0)*	*B (18.0)*	*0*

Table 3-420. Scenic Quality Impacts by Visual Analysis Unit for Segment 2—Blue Mountains								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Glass Hill	0	2,029	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
Variation S2-D1	*Not applicable*							
Variation S2-D2	*Not applicable*							
Mill Creek	0	2,912	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
BA-014 Blue and Wallowa Foothills								
Applicant's Proposed Action	3,826	45,438	B(12.0)	High	Low	C (10.5)	B (12.0)	3,826
Variation S2-A1	*Not applicable*							
Variation S2-A2	*Not applicable*							
Variation S2-B1	*Not applicable*							
Variation S2-B2	*Not applicable*							
Variation S2-C1	*2*	*8,405*	*B (12.0)*	*No change*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S2-C2	*2*	*8,414*	*B (12.0)*	*No change*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S2-E1	*354*	*15,330*	*B (12.0)*	*Low*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S2-E2	*745*	*14,939*	*B (12.0)*	*Low*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S2-F1	*6,707*	*43,582*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*6,707*
Variation S2-F2	*7,380*	*44,064*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*7,380*
Glass Hill	6,826	45,438	B (12.0)	High	Low	C (11.0)	B (12.0)	6,826
Variation S2-D1	*0*	*3,097*	*B (12.0)*	*Low*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S2-D2	*0*	*3,097*	*B (12.0)*	*No change*	*No change*	*B (12.0)*	*B (12.0)*	*0*
Mill Creek	10,043	43,376	B (12.0)	Moderate	Low	C (11.0)	B (12.0)	10,043
BA-015 Baker Valley								
Applicant's Proposed Action	724	19,209	C (9.5)	High	Low	C (8.0)	C (9.5)	724
Variation S2-A1	*Not applicable*							
Variation S2-A2	*Not applicable*							
Variation S2-B1	*Not applicable*							
Variation S2-B2	*Not applicable*							
Variation S2-C1	*Not applicable*							
Variation S2-C2	*Not applicable*							
Variation S2-E1	*0*	*1,290*	*C (9.5)*	*Low*	*Low*	*C (9.5)*	*C (9.5)*	*0*
Variation S2-E2	*0*	*1,290*	*C (9.5)*	*Low*	*Low*	*C (9.5)*	*C (9.5)*	*0*
Variation S2-F1	*724*	*19,209*	*C (9.5)*	*Moderate*	*Low*	*C (8.5)*	*C (9.5)*	*724*
Variation S2-F2	*187*	*18,649*	*C (9.5)*	*Low*	*Low*	*C (9.5)*	*C (9.5)*	*0*

Table 3-420. Scenic Quality Impacts by Visual Analysis Unit for Segment 2—Blue Mountains								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Glass Hill	724	19,209	C (9.5)	High	Low	C (9.5)	C (9.5)	724
Variation S2-D1	*Not applicable*							
Variation S2-D2	*Not applicable*							
Mill Creek	187	18,649	C (9.5)	Low	Low	C (9.5)	C (9.5)	0
BA-016 Pyles Canyon and Thief Valley								
Applicant's Proposed Action	394	6,292	B (16.5)	High	Low	B (15.0)	B (16.5)	394
Variation S2-A1	*Not applicable*							
Variation S2-A2	*Not applicable*							
Variation S2-B1	*Not applicable*							
Variation S2-B2	*Not applicable*							
Variation S2-C1	*Not applicable*							
Variation S2-C2	*Not applicable*							
Variation S2-E1	*Not applicable*							
Variation S2-E2	*Not applicable*							
Variation S2-F1	*394*	*6,292*	*B (16.5)*	*High*	*Low*	*B (15.0)*	*B (16.5)*	*394*
Variation S2-F2	*415*	*6,315*	*B (16.5)*	*High*	*Low*	*B (15.0)*	*B (16.5)*	*415*
Glass Hill	394	6,292	B (16.5)	High	Low	B (15.0)	B (16.5)	394
Variation S2-D1	*Not applicable*							
Variation S2-D2	*Not applicable*							
Mill Creek	415	6,315	B (16.5)	High	Low	B (15.0)	B (16.5)	415
BA-018 Grand Ronde River								
Applicant's Proposed Action	742	4,133	A (21.5)	High	Low	A (20.0)	A (21.5)	4,133
Variation S2-A1	*200*	*4,390*	*A (21.5)*	*High*	*Low*	*A (20.0)*	*A (21.5)*	*4,390*
Variation S2-A2	*147*	*4,443*	*A (21.5)*	*High*	*Low*	*A (20.0)*	*A (21.5)*	*4,443*
Variation S2-B1	*0*	*4,333*	*A (21.5)*	*High*	*Low*	*A (20.0)*	*A (21.5)*	*4,333*
Variation S2-B2	*0*	*4,336*	*A (21.5)*	*High*	*Low*	*A (20.0)*	*A (21.5)*	*4,336*
Variation S2-C1	*0*	*3,329*	*A (21.5)*	*No change*	*Low*	*A (21.5)*	*A (21.5)*	*3,329*
Variation S2-C2	*0*	*3,329*	*A (21.5)*	*No change*	*Low*	*A (21.5)*	*A (21.5)*	*3,329*
Variation S2-E1	*Not applicable*							
Variation S2-E2	*Not applicable*							
Variation S2-F1	*Not applicable*							
Variation S2-F2	*Not applicable*							

Table 3-420. Scenic Quality Impacts by Visual Analysis Unit for Segment 2—Blue Mountains

Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Glass Hill	743	3,994	A (21.5)	High	Low	A (20.0)	A (21.5)	743
Variation S2-D1	*0*	*141*	*A (21.5)*	*No change*	*Low*	*A (21.5)*	*A (21.5)*	*0*
Variation S2-D2	*0*	*141*	*A (21.5)*	*No change*	*Low*	*A (21.5)*	*A (21.5)*	*0*
Mill Creek	509	4,366	A (21.5)	High	Low	A (20.0)	A (21.5)	509

Table 3-421. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 2—Blue Mountains

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Stationary Sensitive Viewing Platforms				
4-3 Bird Track Springs U.S. Forest Service Campground				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S2-A1	*None*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*None*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S2-B2	*None*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Low	IV	Yes	0.0
Mill Creek	Low	Not applicable	Not applicable	Not applicable
4-10 City of North Powder				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S2-F1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Low	Not applicable	Not applicable	Not applicable
4-17 Grande Tour Oregon Tour Route–Thief Valley Reservoir				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S2-F2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Mill Creek	Low	Not applicable	Not applicable	Not applicable
4-19 Hilgard Junction State Park				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S2-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*

Table 3-421. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 2—Blue Mountains				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
Glass Hill	Low	Not applicable	Not applicable	Not applicable
Mill Creek	Moderate	Not applicable	Not applicable	Not applicable
4-26 Ladd Marsh Wildlife Area–Foothill Road				
Mill Creek	High	Not applicable	Not applicable	Not applicable
4-28 Morgan Lake Park				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S2-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S2-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	None	IV	Yes	Not applicable
Mill Creek	None	Not applicable	Not applicable	Not applicable
4-32 Oregon Trail Interpretive Park Picnic Area				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S2-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Low	Not applicable	Not applicable	Not applicable
Mill Creek	Low	Not applicable	Not applicable	Not applicable
4-33 Blue Mountain Forest Double Parking Lot				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S2-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Low	Not applicable	Not applicable	Not applicable
Mill Creek	Low	Not applicable	Not applicable	Not applicable
4-40 Spring Creek U.S. Forest Service Campground				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S2-A1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Moderate	Not applicable	Not applicable	Not applicable
Mill Creek	Moderate	Not applicable	Not applicable	Not applicable
4-51 City of La Grande				
Variation S2-C2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Mill Creek	High	Not applicable	Not applicable	Not applicable

Table 3-421. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 2—Blue Mountains

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
4-55 Elk Song Ranch				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S2-C1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Mill Creek	Low	Not applicable	Not applicable	Not applicable
5-36 Powder River Wild and Scenic River Corridor–Thief Valley Reservoir Road				
Variation S2-F2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Mill Creek	Low	Not applicable	Not applicable	Not applicable
Linear Sensitive Viewing Platforms				
Hells Canyon				
Variation S2-C2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Mill Creek	Low	Not applicable	Not applicable	Not applicable
Grande Tour Route				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S2-C1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Moderate	IV	Yes	0.0
Mill Creek	Low	Not applicable	Not applicable	Not applicable
Grand Tour Scenic Bikeway				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S2-C1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Moderate	IV	Yes	0.0
Mill Creek	Low	Not applicable	Not applicable	Not applicable
Powder River Wild and Scenic River/Thief Valley Road				
Variation S2-F2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84				
Applicant's Proposed Action	High	IV	Yes	0.0
Variation S2-A1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-B1	*Moderate*	*IV*	*Yes*	*0.0*
Variation S2-B2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*

Table 3-421. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 2—Blue Mountains

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Variation S2-E1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-E2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	High	IV	Yes	0.0
Mill Creek	High	Not applicable	Not applicable	Not applicable
State Highway 203				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S2-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Low	IV	Yes	0.0
Mill Creek	Moderate	Not applicable	Not applicable	Not applicable
State Highway 244				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S2-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-B1	*Moderate*	*IV*	*Yes*	*0.0*
Variation S2-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Moderate	IV	Yes	0.0
Mill Creek	Moderate	Not applicable	Not applicable	Not applicable
U.S. Forest Service Road 21				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S2-A1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Moderate*	*Not applicable*	*Not applicable*	*0.0*
Variation S2-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S2-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Moderate	Not applicable	Not applicable	Not applicable
Mill Creek	Moderate	Not applicable	Not applicable	Not applicable
U.S. Forest Service Road 43 – Ladd Canyon Road				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S2-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-E1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-E2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	Moderate	Not applicable	Not applicable	Not applicable
Mill Creek	High	Not applicable	Not applicable	Not applicable

Table 3-422. Conformance with U.S. Forest Service Visual Quality Objectives for Visual Analysis Unit BA-011 Blue Mountain Forest in Segment 2—Blue Mountains

Alternative Route	Visual Quality Objective	Conformance	Visual Quality Objectives met by the B2H Project	Acres of Disturbance	Percent of Total Visual Quality Objective within Study corridor
Applicant's Proposed Action	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	21	0.4
	Partial Retention	No	Maximum Modification	18	0.2
	Modification	Not applicable	Not applicable	0	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0
Variation S2-A1	*Preservation*	*Not applicable*	*Not applicable*	*0*	*0.0*
	Retention	*No*	*Maximum Modification*	*21*	*0.4*
	Partial Retention	*No*	*Maximum Modification*	*18*	*0.2*
	Modification	*Not applicable*	*Not applicable*	*0*	*0.0*
	Maximum Modification	*Not applicable*	*Not applicable*	*0*	*0.0*
Variation S2-A2	*Preservation*	*Not applicable*	*Not applicable*	*0*	*0.0*
	Retention	*Not applicable*	*Not applicable*	*0*	*0.0*
	Partial Retention	*No*	*Maximum Modification*	*69*	*0.8*
	Modification	*No*	*Maximum Modification*	*8*	*0.0*
	Maximum Modification	*Not applicable*	*Not applicable*	*0*	*0.0*
Variation S2-B1	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Variation S2-B2	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Variation S2-C1	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				

Table 3-422. Conformance with U.S. Forest Service Visual Quality Objectives for Visual Analysis Unit BA-011 Blue Mountain Forest in Segment 2—Blue Mountains

Alternative Route	Visual Quality Objective	Conformance	Visual Quality Objectives met by the B2H Project	Acres of Disturbance	Percent of Total Visual Quality Objective within Study corridor
Variation S2-C2	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Variation S2-E1	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Variation S2-E2	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Variation S2-F1	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Variation S2-F2	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Glass Hill	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	21	0.4
	Partial Retention	No	Maximum Modification	8	0.2
	Modification	Not applicable	Not applicable	0	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0
Variation S2-D1	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				

Table 3-422. Conformance with U.S. Forest Service Visual Quality Objectives for Visual Analysis Unit BA-011 Blue Mountain Forest in Segment 2—Blue Mountains					
Alternative Route	**Visual Quality Objective**	**Conformance**	**Visual Quality Objectives met by the B2H Project**	**Acres of Disturbance**	**Percent of Total Visual Quality Objective within Study corridor**
Variation S2-D2	*Preservation*	*Does not cross USFS Land*			
	Retention				
	Partial Retention				
	Modification				
	Maximum Modification				
Mill Creek	Preservation	Not applicable	Not applicable	0	0.0
	Retention	Not applicable	Not applicable	0	0.0
	Partial Retention	No	Maximum Modification	69	1.0
	Modification	No	Maximum Modification	8	0.0
	Maximum Modification	Not applicable	Not applicable	0	0.0

Applicant's Proposed Action Alternative

Effects on Landscape Character and Scenic Quality

Extending generally northwest to southeast, this alternative crosses steeply rolling, forested mountains, and rolling sage steppe hills. Of the 7 VAUs visible within 5 miles of this alternative, one has an A scenic quality rating, 4 have a B scenic quality rating, and 2 have a C scenic quality rating (Table 3-420). The B2H Project components would be visible within both the foreground and middleground of the VAU with A scenic quality (BA-018 Grande Ronde River). This VAU would experience a high degree of impact within the foreground where the B2H Project would cross the river and introduce geometric forms on either side of the river through right-of-way vegetation clearing, but this impact would not change the overall rating of A scenic quality. One of the VAUs with B scenic quality would experience a high impact from the visible foreground areas, which would lower that unit's overall rating to C scenic quality.

Variation S2-A1

This route variation (Link 2-5), follows the same alignment as the Applicant's Proposed Action Alternative, through forested lands with Class B scenic quality. The project contrast associated with this variation would be predominately strong, as the B2H Project would cross lands that are forested and mostly undeveloped resulting in a geometrically cleared right-of-way and transmission line structures incongruent with the existing setting.

Variation S2-A2

This route variation (Link 2-7) is located less than 0.5 mile to the southwest of Variation S2-A1 and is located within forested lands with Class B scenic quality. The B2H Project contrast associated with this variation also would be predominately strong, as the alignment crosses lands that are forested and mostly undeveloped. Since Variation S2-A2 is colocated with an existing 230-kV transmission line,

which has already modified the area's setting, impacts on scenic quality from Variation S2-A2 would be slightly less than those described for Variation S2-A1.

Variation S2-B1

This route variation (Link 2-35), follows the same alignment as the Applicant's Proposed Action Alternative, through forested lands with a Class B scenic quality, just southeast of Hilgard Junction State Park. The B2H Project contrast associated with this variation would be predominately high, as the B2H Project components would cross lands that are forested and mostly undeveloped resulting in a geometrically cleared right-of-way and transmission line structures incongruent with the existing setting.

Variation S2-B2

This route variation (Link 2-25) is located approximately 0.5 mile to the north of the Variation S2-B1, through forested lands with Class B scenic quality. The B2H Project contrast associated with this variation would be predominately strong, as the B2H Project would cross lands that are forested and mostly undeveloped. Since Variation S2-B2 is colocated with an existing 230-kV transmission line that has already modified the area's setting, impacts on scenic quality from Variation S2-B2 would be slightly less than those described for Variation S2-B1. For simulation of variation refer to Appendix H3.

Variation S2-C1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative (Links 2-45, 2-47, 2-50), through forested lands near Morgan Lake with a Class B scenic quality. The project contrast associated with this variation would vary from strong to moderate as the alignment crosses lands that are mostly undeveloped and vary from dense forest to open grasslands resulting in a geometrically cleared right-of-way in forested lands and transmission line structures incongruent with the existing setting.

Variation S2-C2

This route variation (Link 2-48) is located approximately 1.5 miles northeast of the Applicant's Proposed Action Alternative. The project contrast and overall degree of impact on scenic quality associated with this variation would be similar to that of Variation S2-C1; however, it is approximately 0.5 mile shorter in length than S2-C1.

Variation S2-E1

This route variation follows the same alignment through Link 2-60 as the Applicant's Proposed Action Alternative, through forested lands paralleling I-84 with a Class B scenic quality. The B2H Project contrast associated with this variation would vary from strong to moderate, as it would cross through alternating patches of dense forest and open grasslands resulting in a geometrically cleared right-of-way in forested lands and transmission line structures incongruent with the existing setting.

Variation S2-E2

This route variation (Link 2-55 and 2-56) would extend east closer to I-84 than Variation S2-E1, through forested lands associated with a Class B scenic quality landscape. The B2H Project contrast associated with this variation would be less than that of Variation S2-E1 because Variation S2-E2

crosses through less forested lands, resulting in less apparent geometric vegetative forms through right-of-way clearing in grasslands, and is generally located within 0.25 mile of an existing 230-kV transmission line that has modified the existing setting.

Variation S2-F1

Because this route variation follows the same alignment from Link 2-75 to Link 2-95, as the Applicant's Proposed Action Alternative, through rolling sage steppe-covered hills and crossing the I-84 corridor north of the City of North Powder, Oregon. The lands that would be crossed include both Class B and Class C landscapes. The project contrast associated with this variation would range from moderate to strong.

Variation S2-F2

This route variation parallels Variation S2-F1 from Link 2-70 to Link 2-90, and is generally within 0.3 mile of that variation. Variation S2-F2 crosses through the same landscape and scenic quality classes as Variation S2-F1 but would result in a lesser degree of B2H Project contrast since Variation S2-F2 is colocated with an existing 230-kV transmission line that has modified the existing setting.

Effects on Views

Approximately 17.5 miles of high impacts and 15.5 miles of moderate impacts on views associated with residents, recreation, and travel routes would be associated with the Applicant's Proposed Action Alternative.

Effects on Residential Views

In general, the highest impacts on residential viewers would be concentrated in four different locations where residences are located from 0.25 mile to 0.5 mile of the route alignment. Residences near Morgan Lake (including residential Sensitive Viewing Platform Sensitive Viewing Platform 4-55, Elk Song Ranch) would experience unobstructed and skylined views of the B2H Project components within flat to rolling landscapes. Along Glass Hill Road, several scattered residences would have intermittent views of the alternative components that would be partially screened by topography and tall evergreen forest vegetation. A residence near I-84 and Heber Road, and another residence on Jimmy Creek Road also would be within 0.5 mile of the Applicant's Proposed Action Alternative. These residences both currently have views of an existing 230-kV transmission line to the northeast. The Applicant's Proposed Action Alternative would, however, pass to the southwest of the residence near I-84 and Heber Road – effectively surrounding the residence with transmission lines within 0.25 to 0.5 mile.

Variation S2-A1

This route variation follows the same alignment of the Applicant's Proposed Action Alternative through the forested landscape of the rolling Blue Mountains. There would be no residences within 0.5 mile of this route variation.

Variation S2-A2

This route variation is located less than 0.5 mile to the southwest of Variation S2-A1. There would be no residences within 0.5 mile of this alternative route, and associated impacts on residential views would be similar to those associated with Variation S2-A1.

Variation S2-B1

This route variation follows the same alignment of the Applicant's Proposed Action Alternative through the forested landscape of the rolling Blue Mountains. There would be no residences with 0.5 mile of this alternative route.

Variation S2-B2

This route variation is located approximately 0.5 mile to the north of the Variation S2-B1. Only one residence would be within 0.5 mile of this route variation. Views from this residence could have skylined views of the B2H Project components; however, these views would likely be screened by tall evergreen forest vegetation that generally surrounds the residence. Impacts on views from residences would be higher than that of Variation S2-B1.

Variation S2-C1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative through the forested landscape of the steeply rolling Blue Mountains, with two residences within 0.5 mile of the route. The northern residence would have inferior, skylined views of the B2H Project components dominating the residence's viewshed. The southernmost residence would have obstructed views of the B2H Project components due to vegetation and topographic screening.

Variation S2-C2

This route variation is located approximately 1.5 miles northeast of the Applicant's Proposed Action Alternative where would be seven residences within 0.5 mile of this route, including Sensitive Viewing Platform 4-55 (Elk Song Ranch). The Elk Song Ranch Sensitive Viewing Platform and nearby residence would have inferior, skylined views of this variation alignment dominating views from this area, while the remaining residences would have their views of the alignment partially to fully obstructed by tall evergreen vegetation.

Variation S2-E1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative through Link 2-60 traversing forested landscape of the rolling Blue Mountains. There would be no residences within 0.5 mile of this route.

Variation S2-E2

This route variation extends east closer to I-84 than S2-E1 Alternative. There would be one residence within 0.5 mile of this route. This residence would have partially skylined views of the B2H Project components

Variation S2-F1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative and crosses landscapes transitioning from steeper rolling mountains to more gentle rolling hills, directly adjacent to agricultural lands. Impacts associated with residences for this variation alignment would include a residence near I-84 and Heber Road and the residence along Jimmy Creek Road. Impacts on these residences would be the same as those discussed for the Applicant's Proposed Action Alternative throughout the shared alignment.

Variation S2-F2

This route variation parallels Variation S2-F1, and is generally within 0.3 mile of that variation. The Variation S2-F2 alignment would result in a lesser degree of impact in comparison to the Variation S2-F1 alignment because the Variation S2-F2 alignment would pass to the northeast of the residence near I-84 and Heber Road, in close co-location with an existing 230-kV transmission line that has modified the existing setting. Impacts on views from the residence along Jimmy Creek Road also would be slightly less than those associated with Variation S2-F1 because the alignment would be slightly farther away from the residence and more closely colocated with the existing 230-kV transmission line.

Effects on Recreational Views

Impacts on views from stationary viewing platforms associated with recreation would include views from Sensitive Viewing Platform 4-19 (Hilgard Junction State Park) and Sensitive Viewing Platform 4-28 (Morgan Lake Park) Views of the B2H Project components from these Sensitive Viewing Platforms would be mostly screened by existing landforms and tall evergreen vegetation, resulting in low degree of impact. Impacts on views from Sensitive Viewing Platform 4-40 (Spring Creek USFS Campground) would be partially screened by tall evergreen forest vegetation. Where visible from this location, impacts would be moderate because the B2H Project components would be skylined from a distance of approximately 0.25 mile.

The Grande Tour Route and the Grande Tour Scenic Bikeway would both be crossed within a rolling sage steppe landscape that includes views of an existing 230-kV transmission line 0.4 mile away and an existing wind farm 2.3 miles away. Impacts on views from these linear Sensitive Viewing Platforms would be moderate due to the existing modifications present in these viewsheds. There would be no identifiable impacts on SMAs that are associated with recreation.

Variation S2-A1

Impacts on views from stationary, linear, and SMAs for this route variation are associated with Sensitive Viewing Platforms 4-40 and 4-19, which would be the same as those described for the Applicant's Proposed Action Alternative.

Variation S2-A2

Impacts on views from stationary, linear, and SMAs for this route variation are associated with Sensitive Viewing Platforms 4-40 and 4-19, which would be similar to those described for the Applicant's Proposed Action Alternative although this variation would be slightly farther away, less than a quarter mile distance, from the foreground of the Sensitive Viewing Platform 4-19.

Variation S2-B1

There would be no high or moderate impacts on stationary or linear Sensitive Viewing Platforms, or SMAs associated with recreation.

Variation S2-B2

There would be no high or moderate impacts on stationary or linear Sensitive Viewing Platforms, or SMAs associated with recreation.

Variation S2-C1

There would be no high or moderate impacts on stationary or linear Sensitive Viewing Platforms, or SMAs associated with recreation.

Variation S2-C2

There would be high impacts on views from Sensitive Viewing Platform 4-28 (Morgan Lake Park)because there would be continuous, skylined views of the B2H Project components from a distance of less than 0.3 mile dominating the viewshed. There would be no high or moderate impacts on linear Sensitive Viewing Platforms or SMAs that are associated with recreation.

Variation S2-E1

There would be no identifiable impacts on views associated with recreation.

Variation S2-E2

There would be no identifiable impacts on views associated with recreation.

Variation S2-F1

There would be no identifiable impacts on stationary Sensitive Viewing Platforms associated with recreation within 0.5 mile of route. Impacts on linear Sensitive Viewing Platforms for this variation alignment would be the same as those described for Applicant's Proposed Action Alternative regarding the Grande Tour Route and Grande Tour Scenic Bikeway. There would be no identifiable impacts on SMAs that are associated with recreation.

Variation S2-F2

There would be no identifiable impacts on stationary Sensitive Viewing Platforms associated with recreation within 0.5 mile of route. Impacts on linear Sensitive Viewing Platforms for this variation alignment would be associated with the Grande Tour Route and Grande Tour Scenic Bikeway, which share the same alignment in this location. Viewers traveling this route would experience head-on views of Variation S2-F2 in a rolling sage steppe landscape. The variation is colocated with an existing 230-kV transmission line within this area. Views from this route also include wind turbines within approximately 2 miles of the variation alignment, and impacts on the Grande Tour Route and Grande Tour Scenic Bikeway would be low due the extent of existing development that has modified these viewers' viewshed. There would be no identifiable impacts on SMAs that are associated with recreation.

Effects on Views from Travel Routes

Views from I-84 would be highly affected, as the alternative alignment crosses the viewing platform at an angle within a rolling sage steppe valley. Viewers would have head-on, skylined views of the B2H Project components dominating the interstate's viewshed. Viewers also would experience parallel views of the B2H Project components at distance of approximately 0.5 mile, though these views would be partially obstructed by tall evergreen trees within a wooded landscape.

Impacts on views from travel routes would be moderate for three travel routes crossed by the Applicant's Proposed Action Alternative. B2H Project components would be located within 0.2 mile of USFS Road 21, but views from this platform would be partially obstructed by tall evergreen trees within this forested landscape. Views of the B2H Project components from State Highway 244 would be from within a narrow, partially wooded valley. The Applicant's Proposed Action Alternative is expected to span the valley and highway perpendicularly, and would be viewed in addition to an existing 230-kV transmission line that currently spans the valley and has modified the highway's viewshed. Travelers on USFS Road 43-Ladd Canyon Road would experience moderate impacts from within a narrow, wooded canyon. The Applicant's Proposed Action Alternative is expected to span this valley with views of the B2H Project components mostly obstructed by topography and tall evergreen trees.

Variation S2-A1

Impacts associated with views from USFS Service Road 21 would be the same as those described for the Applicant's Proposed Action Alternative. Parallel views from I-84 would be moderately affected because the B2H Project components would be visible at a distance of approximately 0.4 mile partially screened by topography and tall evergreen trees.

Variation S2-A2

Impacts associated with USFS Service Road 21 would be the same as those described for the Applicant's Proposed Action Alternative. Parallel views from I-84 would be less affected than views of Variation S2-A1 because the B2H Project components would be located further from the viewing platform, and views would be mostly obstructed and backdropped by tall evergreen trees in this forested landscape.

Variation S2-B1

Views of the B2H Project components from State Highway 244 would be inferior, and would include skylined views that would be partially screened by tall evergreen trees.

Variation S2-B2

Impacts associated with this variation would be similar to those described for Variation S2-B1 although it is approximately 0.5 mile closer to Sensitive Viewing Platform I-84.

Variation S2-C1

Views from travel routes would not be highly or moderately affected by the B2H Project along this variation.

Variation S2-C2

Although the variation runs approximately 1.5 miles closer to Sensitive Viewing Platform I-84, views from travel routes would not be highly or moderately affected by the B2H Project along this variation.

Variation S2-E1

Travelers on Interstate 84 would have views of the B2H Project from a distance as close as 0.3 mile. Views of the B2H Project components within this rolling, partially wooded valley also would include an existing 230-kV transmission line within 0.2 mile of the Variation S2-E1 alignment. Views from this travel route would experience moderate impacts since the existing transmission line has modified existing views from the interstate.

Variation S2-E2

Impacts on views from I-84 would be less than those described for Variation S2-E1 because Variation S2-E2 is located farther away from I-84 and would be partially screened by clusters of tall evergreen trees.

Variation S2-F1

Views from I-84 would experience high impacts, as the alternative alignment crosses the viewing platform at an angle within a rolling sage steppe valley. Viewers would have head-on, skylined views of the B2H Project components dominating the viewshed.

Variation S2-F2

Impacts on views from I-84 would be less than that of Variation S2-F1 because Variation S2-F2 is colocated with an existing 230-kV transmission line where it crosses I-84 reducing the level of contrast introduced by the B2H Project.

Conformance with Management Objectives

If the Applicant's Proposed Action Alternative were selected, the B2H Project would conform to management objectives for BLM-administered lands. However, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs established in Table 3-422 would include 21 acres of non-conformance with the Retention VQO and 18 acres of noncompliance with the Partial Retention VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Variation S2-A1

Conformance with USFS management objectives associated with this route variation would be the same as described for of the Applicant's Proposed Action Alternative. This variation does not cross BLM-administered land.

Variation S2-A2

There would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU, and the acres of non-conformance with USFS management objectives would be greater than that of Variation S2-A2. This occurrence would include 69 acres of non-conformance in the Partial Retention VQO and 8 acres of non-conformance in the Modification VQO. Areas of non-conformance

with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4. This variation does not cross BLM-administered land.

Variations S2-B1, S2-B2

These variations do not cross USFS-administered land and would conform to BLM management objectives.

Variations S2-C1, S2-C2,

These variations do not cross BLM- or USFS-administered land.

Variations S2-E1, S2-E2, S2-F1, and S2-F2

These variations do not cross USFS land and would conform to BLM management objectives.

Glass Hill Alternative

Effects on Landscape Character and Scenic Quality

Similar to the Applicant's Proposed Action Alternative, this route extends generally northwest to southeast, through steeply rolling, forested mountains, and rolling sage steppe hills and is approximately the same length. The Glass Hill Alternative crosses the same 7 VAUs that the Applicant's Proposed Action Alternative crosses, with a similar degree of impact on each VAU.

Variation S2-D1

This route variation follows the same alignment through Links 2-42 and 2-47 as the Glass Hill Alternative, through forested lands that are associated with B scenic quality. The B2H Project contrast associated with this variation would be predominately strong, as the B2H Project crosses lands that are forested and mostly undeveloped resulting in a geometrically cleared right-of-way and transmission line structures incongruent with the existing setting.

Variation S2-D2

This route variation is located up to 0.9 mile to the south of Variation S2-D1, with similar impacts on scenic quality.

Effects on Views

The Glass Hill Alternative would have 1.8 miles less of high impacts and 3.1 miles less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

Impacts on residential views associated with the Glass Hill Alternative would be similar to those described for the Applicant's Proposed Action Alternative, except that the Glass Hill Alternative would not impact the Elk Song Ranch Sensitive Viewing Platform (4-55) or nearby residence.

Variation S2-D1

This route variation follows the same alignment as the Glass Hill Alternative, and would not have any residences within 0.5 mile of the route but would be closer to the residences on Glass Hill Road than variation S2-D2.

Variation S2-D2

Similar to Variation S2-D1, this variation would not have any residences within 0.5 mile of the route.

Effects on Recreational Views

The impacts from this route would be similar to those of the Applicant's Proposed Action Alternative, except that the Glass Hill Alternative would not impact views from Sensitive Viewing Platform 4-28 (Morgan Lake Park).

Variation S2-D1

This route would not have any impacts on views associated with Sensitive Viewing Platforms related to recreation.

Variation S2-D2

This route would not have any impacts on views associated with Sensitive Viewing Platforms related to recreation.

Effects on Views from Travel Routes

Impacts on travel routes are the same as the Applicant's Proposed Action Alternative since the alternatives share the same alignment in proximity to Interstate 84, State Highway 244, USFS Road 21, and USFS Road 43 – Ladd Canyon Road.

Variations S2-D1 and S2-D2

These variations would not impact views from travel routes.

Conformance with Management Objectives

If the Glass Hill Alternative is selected, the B2H Project would conform to management objectives for BLM-administered lands. However, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs established in Table 3-422 would include 21 acres of non-conformance with the Retention VQO and 8 acres of noncompliance with the Partial Retention VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Variations S2-D1 and S2-D2

These variations do not cross BLM- or USFS-administered lands.

Mill Creek Alternative

Effects on Landscape Character and Scenic Quality

Similar to the Applicant's Proposed Action Alternative, this route extends generally northwest to southeast, crossing steeply rolling, forested mountains and rolling sage steppe hills and is approximately the same length. The Mill Creek Alternative crosses the same 7 VAUs as the Applicant's Proposed Action Alternative, but would have lesser impacts because it is colocated with an existing 230-kV transmission line (Table 3-420). The single VAU with A scenic quality, BA-018 Grande Ronde River, would experience high impacts from the Mill Creek Alternative due to right-of-way vegetation clearing on either side of the river generating geometric forms that would change the scenic quality

score, but not change the overall classification of Class A scenery. One of the four VAUs with B scenic quality would experience moderate impacts on scenic quality, which would lower the scenic quality rating score, and lower the overall classification to Class C, where visible.

Effects on Views

The Mill Creek Alternative would have 5.1 miles less of high impacts and 0.4 mile more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

The Mill Creek Alternative would have higher impacts on residences than either the Applicant's Proposed Action Alternative or the Glass Hill Alternative because the Mill Creek Alternative would extend closer to the City of La Grande, Oregon and affect a higher number of residences. The highest impacts on residences would generally occur in six different locations, including the Rock Creek Canyon area, the La Grande area, the Foothill Road area, the Ladd Canyon area, the residence near I-84 and Heber Road, and the residence along Jimmy Creek Road – where residences would be within 0.5 mile of the Mill Creek Alternative alignment. Views from the residences in the Rock Creek Canyon area and La Grande area (including the City of La Grande Sensitive Viewing Platform – 4-51) would generally include skylined views that would be partially to fully screened by tall evergreen vegetation but where visible, the B2H Project would dominate these views. The residences in the Foothill Road and Ladd Canyon areas would experience continuous, skylined views of the B2H Project components from inferior viewing positions. Impacts on the residence near I-84 and Heber Road, and the residence along Jimmy Creek Road would be the same as those described for Variation S2-F2.

Effects on Recreational Views

Impacts on views from stationary Sensitive Viewing Platforms would be associated with Sensitive Viewing Platform 4-19 (Hilgard Junction State Park), Sensitive Viewing Platform 4-40 (Spring Creek USFS Campground) and Sensitive Viewing Platform 4-26 (Ladd Marsh Wildlife Area-Foothill Road). Impacts on the views from Sensitive Viewing Platform 4-19 and Sensitive Viewing Platform 4-40 would both be moderate, including skylined views that would be partially obstructed by tall evergreen trees, and where the alternative route is colocated with an existing 230-kV transmission line that has modified the existing setting. Views from Sensitive Viewing Platform 2-26 would include skylined views from an inferior viewing location at a distance of less than 0.4 mile. Although the Mill Creek Alternative is colocated with an existing 230-kV transmission line in this area, the relative scale of the B2H Project components would result in a high impact from Sensitive Viewing Platform 2-26. Impacts on views from linear Sensitive Viewing Platforms would be related to the Grande Tour Route and Grande Tour Scenic Bikeway. These impacts would be the same as those discussed for Variation S2-F2. This alternative would not have an impact on views from SMAs associated with recreation.

Effects on Views from Travel Routes

Impacts associated with this alternative would be similar to the Applicant's Proposed Alternative except for views from I-84 and State Highway 203. The Mill Creek Alternative crosses Interstate 84 three

times, including two crossings in Ladd Canyon resulting in high impacts. Views from State Highway 203 would be moderately affected since this alternative, and associated vegetation clearing in the right-of-way, would attract attention of motorists on the highway.

Conformance with Management Objectives

If the Mill Creek Alternative is selected, the B2H Project would conform to management objectives for BLM-administered lands. However, there would be areas of non-conformance on USFS-administered lands in the BA-011 Blue Mountains Forest VAU. The areas of non-conformance with VQOs established in the Wallowa-Whitman National Forest LRMP would include 8 acres of non-conformance with the Modification VQO and 69 acres of noncompliance with the Partial Retention VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Conclusions

Impacts associated with the alternatives and variations within Segment 2 vary based on the types of effects being considered (e.g. landscape character and scenic quality, types of viewers, and conformance with management objectives). While both the Applicant's Proposed Action Alternative and Glass Hill alternatives cross partially forested lands that are mostly undeveloped, the Mill Creek Alternative is mostly colocated with right-of-way clearings for an existing 230-kV transmission line, or an existing pipeline. The Mill Creek Alternative would result in lesser impact on landscape character and scenic quality because the proposed transmission features and right-of-way clearings would be similar to those of the existing right-of-way clearings and transmission lines and structures within the right-of-way for the 230-kV transmission line. However, the Mill Creek Alternative would have the highest impact on viewers based on its closer proximity and visibility from travel routes and residential viewers, including a high number of viewers in and around the City of La Grande, Oregon. The Applicant's Proposed and Glass Hill alternatives would primarily follow the same alignment, but the Applicant's Proposed Alternative would pass closer, and be visible, to the recreational viewers at Morgan Lake (Sensitive Viewing Platform 4-28). There would be no significant differences in impacts on viewers when comparing the two variations associated with the Glass Hill Alternative (variations S2-D1 and S2-D2).

All three of the alternatives in Segment 2 would include non-conformance with USFS VQOs. The Glass Hill Alternative however, would have fewer acres of non-conformance.

SEGMENT 3—BAKER VALLEY

The following narrative discussions describe the impacts associated with each alternative in Segment 3. Additional details regarding these analyses can be found in Table 3-423, Table 3-424, Table 3-425, and Table 3-426. Table 3-424 presents the scenic quality impacts by VAU for each alternative route and route variation within Segment 3. This table includes the acreage within the foreground and middleground of each VAU that would have views of each alternative alignment. The existing scenic quality rating of each VAU also is included in this table, along with the residual scenic quality rating and

score for both the foreground and middleground acreage. These residual scenic quality scores are based on the amount of change in score anticipated based on the criteria presented in Table 3-424.

Potential impacts on viewers are represented in Table 3-423 and Table 3-425. Table 3-423 presents an overall comparison of impacts on viewers, as measured in miles of high, moderate, and low impacts. The mileages of impacts are associated with the impacts as they relate back to the alignment of each alternative in Segment 3. This table also includes the total mileage of each alignment. Table 3-425 presents specific impacts anticipated from Sensitive Viewing Platforms, along with the status of conformance with BLM VRM objectives for BLM-related Sensitive Viewing Platforms within Segment 3. Each assessment of conformance also is accompanied by the length of the alternative that can be viewed crossing the associated BLM VRM Class(es).

Conformance with USFS VQOs are presented in Table 3-426. These determinations are based on the expected degree of impact on the landscape character within VAU BA-013 (Wallowa Mountains) and VAU BA-014 (Blue and Wallowa Foothills) which are the only VAUs with USFS lands that are crossed by the B2H Project in Segment 3. The determinations of conformance with USFS VQOs are based on the criteria provided in Table 3-426.

At the end of this section is a conclusion of the impacts on Segment 3, which provides an overview of impacts as well as to which alternative routes and/or variations would be preferable. Because there are several facets to consider when analyzing potential impacts on visual resources (e.g. landscape character and scenic quality, viewers, and plan conformance), this overview provides preferences associated with each of those facets.

Table 3-423. Residual Impacts on Viewers for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Residual Impacts (miles)		
		High	Moderate	Low
Applicant's Proposed Action	55.2	28.9	17.6	8.7
Variation S3-A1	*12.4*	*0.0*	*5.7*	*6.7*
Variation S3-A2	*12.2*	*0.0*	*1.3*	*10.9*
Variation S3-B1	*13.9*	*4.2*	*8.4*	*1.3*
Variation S3-B2	*14.4*	*6.6*	*7.5*	*0.3*
Variation S3-B3	*14.7*	*6.4*	*6.7*	*1.6*
Variation S3-B4	*14.3*	*5.2*	*6.9*	*2.2*
Variation S3-B5	*14.0*	*6.3*	*7.5*	*0.2*
Variation S3-C1	*21.1*	*17.4*	*3.0*	*0.7*
Variation S3-C2	*21.7*	*19.3*	*1.7*	*0.7*
Variation S3-C3	*21.1*	*16.2*	*4.9*	*0.0*
Variation S3-C4	*21.4*	*15.7*	*5.7*	*0.0*
Variation S3-C5	*21.0*	*8.1*	*8.7*	*4.2*
Variation S3-C6	*24.7*	*13.8*	*6.1*	*4.8*
Flagstaff A	55.3	31.0	16.7	7.6
Timber Canyon	70.3	56.3	10.2	3.8

Table 3-423. Residual Impacts on Viewers for Segment 3—Baker Valley				
Alternative Route	**Total Length (miles)**	**Residual Impacts (miles)**		
		High	**Moderate**	**Low**
Flagstaff A – Burnt River Mountain	55.3	29.8	18.6	6.9
Flagstaff B	56.0	31.1	15.9	9.0
Flagstaff B – Burnt River West	55.7	21.8	17.2	16.7
Flagstaff B – Durkee	59.6	27.5	19.0	13.1

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	**Acres Visible**		**Existing Scenic Quality Class (Rating)**	**Residual Impact Level**		**Residual Scenic Quality Class (Rating)**		**Total Change in Scenic Quality Rating (in acres)**
	Foreground	**Middleground**		**Foreground**	**Middleground**	**Foreground**	**MIddleground**	
BA-010 Eagle Creek								
Applicant's Proposed Action	Not applicable							
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*Not applicable*							
Variation S3-B2	*Not applicable*							
Variation S3-B3	*Not applicable*							
Variation S3-B4	*Not applicable*							
Variation S3-B5	*Not applicable*							
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	*Not applicable*							
Timber Canyon	1,897	6,108	A (22.0)	High	Low	A (20.5)	A (22.0)	1,897
Flagstaff A – Burnt River Mountain	Not applicable							
Flagstaff B	Not applicable							
Flagstaff B – Burnt River West	Not applicable							
Flagstaff B – Durkee	Not applicable							

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-013 Wallowa Mountains								
Applicant's Proposed Action	0	523	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
Variation S3-A1	*0*	*523*	*B (18.0)*	*No change*	*Low*	*B (18.0)*	*B (18.0)*	*0*
Variation S3-A2	*0*	*898*	*B (18.0)*	*No change*	*Low*	*B (18.0)*	*B (18.0)*	*0*
Variation S3-B1	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-B2	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-B3	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-B4	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-B5	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-C1	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-C2	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-C3	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-C4	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-C5	*Not applicable*		*B (18.0)*	*Not applicable*				
Variation S3-C6	*Not applicable*		*B (18.0)*	*Not applicable*				
Flagstaff A	0	523	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
Timber Canyon	15,712	56,574	B (18.0)	High	Low	B (16.5)	B (18.0)	0
Flagstaff A – Burnt River Mountain	0	523	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
Flagstaff B	0	523	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
Flagstaff B – Burnt River West	0	898	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
Flagstaff B – Durkee	0	523	B (18.0)	No change	Low	B (18.0)	B (18.0)	0
BA-014 Blue and Wallowa Foothills								
Applicant's Proposed Action	24,997	117,304	B (12.0)	Moderate	Low	C (11.0)	B (12.0)	24,997
Variation S3-A1	*7,481*	*55,260*	*B (12.0)*	*Moderate*	*Low*	*C (10.5)*	*B (12.0)*	*7,481*
Variation S3-A2	*7,691*	*55,453*	*B (12.0)*	*Moderate*	*Low*	*C (10.5)*	*B (12.0)*	*7,691*
Variation S3-B1	*8,363*	*61,273*	*B (12.0)*	*High*	*Moderate*	*C (10.5)*	*C (11.0)*	*69,636*
Variation S3-B2	*6,407*	*64,770*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*71,177*
Variation S3-B3	*6,376*	*65,443*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*71,819*
Variation S3-B4	*5,603*	*65,601*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*71,204*
Variation S3-B5	*5,686*	*64,799*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*70,485*
Variation S3-C1	*5,000*	*33,144*	*B (12.0)*	*High*	*Low*	*C (10.5)*	*B (12.0)*	*5,000*
Variation S3-C2	*4,999*	*33,145*	*B (12.0)*	*High*	*Low*	*C (10.5)*	*B (12.0)*	*4,999*

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Variation S3-C3	*5,345*	*32,799*	*B (12.0)*	*High*	*Low*	*C (10.5)*	*B (12.0)*	*5,345*
Variation S3-C4	*5,089*	*33,054*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*5,089*
Variation S3-C5	*3,3233*	*36,488*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*3,3233*
Variation S3-C6	*2,109*	*39,692*	*B (12.0)*	*Moderate*	*Low*	*C (11.0)*	*B (12.0)*	*2,109*
Flagstaff A	22,318	121,074	B (12.0)	High	Moderate	C (10.5)	C (11.0)	143,392
Timber Canyon	5,449	71,479	B (12.0)	High	Low	C (10.5)	B (12.0)	5,449
Flagstaff A – Burnt River Mountain	22,663	120,729	B (12.0)	Low	Low	B (12.0)	B (12.0)	0
Flagstaff B	23,007	121,718	B (12.0)	Low	Low	B (12.0)	B (12.0)	0
Flagstaff B – Burnt River West	21,450	125,255	B (12.0)	Low	Low	B (12.0)	B (12.0)	0
Flagstaff B – Durkee	20,117	128,267	B (12.0)	Low	Low	B (12.0)	B (12.0)	0
BA-015 Baker Valley								
Applicant's Proposed Action	882	42,851	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	882
Variation S3-A1	*845*	*38,558*	*C (9.5)*	*High*	*Low*	*C (7.0)*	*C (9.5)*	*845*
Variation S3-A2	*567*	*36,564*	*C (9.5)*	*High*	*Low*	*C (7.0)*	*C (9.5)*	*567*
Variation S3-B1	*300*	*23,769*	*C (9.5)*	*High*	*Low*	*C (7.0)*	*C (9.5)*	*300*
Variation S3-B2	*1,951*	*64,770*	*C (9.5)*	*High*	*Moderate*	*C (7.0)*	*C (8.5)*	*66,721*
Variation S3-B3	*1,951*	*64,770*	*C (9.5)*	*High*	*Moderate*	*C (7.0)*	*C (8.5)*	*66,721*
Variation S3-B4	*2,394*	*28,295*	*C (9.5)*	*High*	*Moderate*	*C (7.0)*	*C (8.5)*	*30,689*
Variation S3-B5	*2,316*	*27,906*	*C (9.5)*	*High*	*Moderate*	*C (7.0)*	*C (8.5)*	*30,222*
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	2,896	46,825	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	2,896
Timber Canyon	0	12,558	C (9.5)	No change	Low	C (9.5)	C (9.5)	0
Flagstaff A – Burnt River Mountain	2,896	46,825	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	2,896
Flagstaff B	2,552	47,231	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	2,552
Flagstaff B – Burnt River West	2,277	45,392	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	2,277
Flagstaff B – Durkee	2,552	47,231	C (9.5)	Moderate	Low	C (8.5)	C (9.5)	2,552

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-016 Pyles Canyon and Thief Valley								
Applicant's Proposed Action	0	7,563	B (16.5)	No change	Low	B (16.5)	B (16.5)	0
Variation S3-A1	*0*	*7,563*	*B (16.5)*	*No change*	*Low*	*B (16.5)*	*B (16.5)*	*0*
Variation S3-A2	*14*	*7,612*	*B (16.5)*	*Low*	*Low*	*B (16.5)*	*B (16.5)*	*0*
Variation S3-B1	*0*	*18*	*B (16.5)*	*No change*	*Low*	*B (16.5)*	*B (16.5)*	*0*
Variation S3-B2	*0*	*18*	*B (16.5)*	*No change*	*Low*	*B (16.5)*	*B (16.5)*	*0*
Variation S3-B3	*0*	*18*	*B (16.5)*	*No change*	*Low*	*B (16.5)*	*B (16.5)*	*0*
Variation S3-B4	*0*	*18*	*B (16.5)*	*No change*	*Low*	*B (16.5)*	*B (16.5)*	*0*
Variation S3-B5	*0*	*18*	*B (16.5)*	*No change*	*Low*	*B (16.5)*	*B (16.5)*	*0*
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	0	7,563	B (16.5)	No change	Low	B (16.5)	B (16.5)	0
Timber Canyon	763	6,234	B (16.5)	High	Low	B (16.5)	B (16.5)	0
Flagstaff A – Burnt River Mountain	2,896	46,825	B (16.5)	No change	Low	B (16.5)	B (16.5)	0
Flagstaff B	0	7,563	B (16.5)	No change	Low	B (16.5)	B (16.5)	0
Flagstaff B – Burnt River West	14	7,612	B (16.5)	No change	Low	B (16.5)	B (16.5)	0
Flagstaff B – Durkee	0	7,563	B (16.5)	No change	Low	Not applicable		
BA-019 Lower Powder Valley								
Applicant's Proposed Action	0	5,423	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Variation S3-A1	*0*	*860*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-A2	*0*	*875*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B1	*0*	*5,423*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B2	*0*	*1,278*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B3	*0*	*1,278*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B4	*0*	*1,273*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B5	*0*	*1,225*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	0	1,225	C (10.5)	No change	Low	Not applicable		
Timber Canyon	Not applicable		C (10.5)	Not applicable				
Flagstaff A – Burnt River Mountain	0	7,563	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff B	0	1,278	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff B – Burnt River West	0	1,293	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff B – Durkee	0	1,278	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
BA-020 Bowen Valley								
Applicant's Proposed Action	Not applicable							
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*Not applicable*							
Variation S3-B2	*0*	*1,112*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*Not applicable*
Variation S3-B3	*0*	*1,112*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*Not applicable*
Variation S3-B4	*0*	*1,112*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*Not applicable*
Variation S3-B5	*0*	*1,112*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*Not applicable*
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	0	1,112	C (10.5)	No change	*Low*	C (10.5)	C (10.5)	Not applicable
Timber Canyon	Not applicable							
Flagstaff A – Burnt River Mountain	0	1,225	C (10.5)	No change	*Low*	C (10.5)	C (10.5)	Not applicable
Flagstaff B	0	1,112	C (10.5)	No change	*Low*	C (10.5)	C (10.5)	Not applicable
Flagstaff B – Burnt River West	0	1,112	C (10.5)	No change	*Low*	C (10.5)	C (10.5)	Not applicable
Flagstaff B – Durkee	0	1,112	C (10.5)	No change	*Low*	C (10.5)	C (10.5)	Not applicable

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-021 Virtue Flat								
Applicant's Proposed Action	593	7,778	C (10.5)	Moderate	Low	C (10.5)	C (10.5)	0
Variation S3-A1	*0*	*317*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-A2	*0*	*317*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B1	*593*	*7,778*	*C (10.5)*	*Moderate*	*Low*	*C (9.5)*	*C (10.5)*	*593*
Variation S3-B2	*0*	*5,603*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B3	*0*	*5,603*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B4	*0*	*5,093*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-B5	*0*	*5,148*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	0	5,547	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Timber Canyon	Not applicable							
Flagstaff A – Burnt River Mountain	0	5,547	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff B	0	6,002	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff B – Burnt River West	0	6,002	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff B – Durkee	0	6,002	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
BA-022 Eagle Valley								
Applicant's Proposed Action	Not applicable							
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*Not applicable*							
Variation S3-B2	*Not applicable*							
Variation S3-B3	*Not applicable*							
Variation S3-B4	*Not applicable*							
Variation S3-B5	*Not applicable*							
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	Not applicable							
Timber Canyon	1,484	8,311	B (13.0)	High	Low	C (11.5)	B (13.0)	1,484
Flagstaff A – Burnt River Mountain	Not applicable							
Flagstaff B	Not applicable							
Flagstaff B – Burnt River West	Not applicable							
Flagstaff B – Durkee	Not applicable							
BA-023 Eagle Valley Foothills								
Applicant's Proposed Action	Not applicable							
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*Not applicable*							
Variation S3-B2	*Not applicable*							
Variation S3-B3	*Not applicable*							
Variation S3-B4	*Not applicable*							
Variation S3-B5	*Not applicable*							
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	Not applicable							
Timber Canyon	5,798	35,121	B (13.5)	High	Moderate	B (12.0)	B (12.5)	5,798
Flagstaff A – Burnt River Mountain	Not applicable							
Flagstaff B	Not applicable							
Flagstaff B – Burnt River West	Not applicable							
Flagstaff B – Durkee	Not applicable							

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-024 Sutton Creek								
Applicant's Proposed Action	0	3,911	C (9.5)	No change	Low	C (9.5)	C (9.5)	0
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*0*	*3,911*	*C (9.5)*	*No change*	*Low*	*C (9.5)*	*C (9.5)*	*0*
Variation S3-B2	*1,330*	*2,580*	*C (9.5)*	*High*	*Moderate*	*C (8.0)*	*C (8.5)*	*3,910*
Variation S3-B3	*1,525*	*2,386*	*C (9.5)*	*High*	*Moderate*	*C (8.0)*	*C (8.5)*	*3,911*
Variation S3-B4	*1,535*	*2,386*	*C (9.5)*	*High*	*Moderate*	*C (8.0)*	*C (8.5)*	*3,911*
Variation S3-B5	*1,330*	*2,580*	*C (9.5)*	*High*	*Moderate*	*C (8.0)*	*C (8.5)*	*3,910*
Variation S3-C1	*Not applicable*							
Variation S3-C2	*Not applicable*							
Variation S3-C3	*Not applicable*							
Variation S3-C4	*Not applicable*							
Variation S3-C5	*Not applicable*							
Variation S3-C6	*Not applicable*							
Flagstaff A	1,330	2,580	C (9.5)	High	Low	C (8.0)	C (9.5)	1,330
Timber Canyon	Not applicable							
Flagstaff A – Burnt River Mountain	1,330	2,580	C (9.5)	High	Low	C (8.0)	C (9.5)	1,330
Flagstaff B	1,525	2,386	C (9.5)	High	Low	C (8.0)	C (9.5)	1,525
Flagstaff B – Burnt River West	1,525	2,386	C (9.5)	High	Low	C (8.0)	C (9.5)	1,525
Flagstaff B – Durkee	1,525	2,386	C (9.5)	High	Low	C (8.0)	C (9.5)	1,525
BA-025 Juniper and Sugarloaf Mountains								
Applicant's Proposed Action	4,698	80,581	B (17.5)	High	Moderate	B (16.0)	B (16.5)	4,698
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*0*	*4,135*	*B (17.5)*	*No change*	*Low*	*B (17.5)*	*B (17.5)*	*0*
Variation S3-B2	*0*	*4,236*	*B (17.5)*	*No change*	*Low*	*B (17.5)*	*B (17.5)*	*0*
Variation S3-B3	*0*	*4,236*	*B (17.5)*	*No change*	*Low*	*B (17.5)*	*B (17.5)*	*0*
Variation S3-B4	*0*	*4,236*	*B (17.5)*	*No change*	*Low*	*B (17.5)*	*B (17.5)*	*0*
Variation S3-B5	*0*	*4,236*	*B (17.5)*	*No change*	*Low*	*B (17.5)*	*B (17.5)*	*0*
Variation S3-C1	*4,698*	*76,795*	*B (17.5)*	*High*	*Moderate*	*B (16.0)*	*B (16.5)*	*4,698*
Variation S3-C2	*4,509*	*79,566*	*B (17.5)*	*High*	*Moderate*	*B (16.0)*	*B (16.5)*	*4,509*

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Variation S3-C3	*4,797*	*82,439*	*B (17.5)*	*High*	*Moderate*	*B (16.0)*	*B (16.5)*	*4,797*
Variation S3-C4	*5,477*	*82,611*	*B (17.5)*	*High*	*Moderate*	*B (16.0)*	*B (16.5)*	*5,477*
Variation S3-C5	*10,078*	*78,180*	*B (17.5)*	*High*	*Moderate*	*B (16.0)*	*B (16.5)*	*10,078*
Variation S3-C6	*13,585*	*72,323*	*B (17.5)*	*High*	*Moderate*	*B (16.0)*	*B (16.5)*	*13,585*
Flagstaff A	4,968	80,610	B (17.5)	High	Moderate	B (16.0)	B (16.5)	4,968
Timber Canyon	9,810	79,693	B (17.5)	High	Low	B (16.0)	B (17.5)	0
Flagstaff A – Burnt River Mountain	4,797	86,252	B (17.5)	High	Moderate	B (16.0)	B (16.5)	4,797
Flagstaff B	4,698	80,610	B (17.5)	High	Moderate	B (16.0)	B (16.5)	4,698
Flagstaff B – Burnt River West	10,078	81,994	B (17.5)	High	Moderate	B (16.0)	B (16.5)	10,078
Flagstaff B – Durkee	13,585	76,134	B (17.5)	High	Moderate	B (16.0)	B (16.5)	89,719
BA-026 Durkee Creek								
Applicant's Proposed Action	726	6,047	C (10.5)	High	Moderate	C (9.0)	C (9.5)	6,773
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*Not applicable*							
Variation S3-B2	*Not applicable*							
Variation S3-B3	*Not applicable*							
Variation S3-B4	*Not applicable*							
Variation S3-B5	*Not applicable*							
Variation S3-C1	*726*	*6,047*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*6,773*
Variation S3-C2	*1,271*	*5,502*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*6,773*
Variation S3-C3	*380*	*6,393*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*6,773*
Variation S3-C4	*141*	*6,632*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*6,773*
Variation S3-C5	*0*	*6,773*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Variation S3-C6	*0*	*5,202*	*C (10.5)*	*No change*	*Low*	*C (10.5)*	*C (10.5)*	*0*
Flagstaff A	726	6,047	C (10.5)	High	Low	C (10.5)	C (10.5)	726
Timber Canyon	0	2,450	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff A – Burnt River Mountain	380	6,393	C (10.5)	High	Low	C (9.5)	C (10.5)	380
Flagstaff B	726	6,047	C (10.5)	High	Low	C (9.5)	C (10.5)	726
Flagstaff B – Burnt River West	0	6,773	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Flagstaff B – Durkee	0	5,202	C (10.5)	No change	Low	C (10.5)	C (10.5)	0

Table 3-424. Scenic Quality Impacts by Visual Analysis Unit for Segment 3—Baker Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-027 Caribou Bar								
Applicant's Proposed Action	3,332	5,465	C (11.0)	Moderate	Low	C (10.0)	C (11.0)	3,332
Variation S3-A1	*Not applicable*							
Variation S3-A2	*Not applicable*							
Variation S3-B1	*Not applicable*							
Variation S3-B2	*Not applicable*							
Variation S3-B3	*Not applicable*							
Variation S3-B4	*Not applicable*							
Variation S3-B5	*Not applicable*							
Variation S3-C1	*3,332*	*5,465*	*C (11.0)*	*High*	*Low*	*C (9.5)*	*C (11.0)*	*3,332*
Variation S3-C2	*3,332*	*5,465*	*C (11.0)*	*High*	*Low*	*C (9.5)*	*C (11.0)*	*3,332*
Variation S3-C3	*3,323*	*5,474*	*C (11.0)*	*High*	*Low*	*C (9.5)*	*C (11.0)*	*3,323*
Variation S3-C4	*3,323*	*5,474*	*C (11.0)*	*Moderate*	*Low*	*C (10.0)*	*C (11.0)*	*3,323*
Variation S3-C5	*507*	*8,289*	*C (11.0)*	*Low*	*Low*	*C (11.0)*	*C (11.0)*	*0*
Variation S3-C6	*404*	*7,785*	*C (11.0)*	*Low*	*Low*	*C (11.0)*	*C (11.0)*	*0*
Flagstaff A	3,332	5,465	C (11.0)	High	Low	C (9.5)	C (11.0)	3,332
Timber Canyon	3,332	5,465	C (11.0)	Moderate	Low	C (10.0)	C (11.0)	3,332
Flagstaff A – Burnt River Mountain	3,323	5,474	C (11.0)	High	Low	C (9.5)	C (11.0)	3,323
Flagstaff B	3,332	5,465	C (11.0)	High	Low	C (9.5)	C (11.0)	3,332
Flagstaff B – Burnt River West	507	8,289	C (11.0)	Moderate	Low	C (10.0)	C (11.0)	507
Flagstaff B – Durkee	404	7,785	C (11.0)	Moderate	Low	C (10.0)	C (11.0)	404

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
Stationary Sensitive Viewing Platforms				
4-10 City of North Powder				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Timber Canyon	Low	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable
4-17 Grande Tour Oregon Tour Route–Thief Valley Reservoir				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable
5-25a Oregon Trail Area of Critical Environmental Concern – National Historic Oregon Trail Interpretive Center (Flagstaff Hill Trail, South)				
Applicant's Proposed Action	Moderate	III	Yes	0.0
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S3-B1	*Low*	*III*	*Yes*	*0.0*
Variation S3-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S3–B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
5-25b Oregon Trail Area of Critical Environmental Concern – National Historic Oregon Trail Interpretive Center (Flagstaff Hill Trail, North)				
Applicant's Proposed Action	Low	III	Yes	0.0
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S3-B1	*Low*	*III*	*Yes*	*0.0*
Variation S3-B1	*Low*	*IV*	*Yes*	*0.0*
5-25c Oregon Trail Area of Critical Environmental Concern – National Historic Oregon Trail Interpretive Center (Panorama Point)				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
5-25d Oregon Trail Area of Critical Environmental Concern – National Historic Oregon Trail Interpretive Center (Main Building)				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S3-B1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Moderate	Not applicable	Not applicable	Not applicable

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
5-25e Oregon Trail Area of Critical Environmental Concern – National Historic Oregon Trail Interpretive Center (Wagon Encampment)				
Applicant's Proposed Action	High	III	Yes	0.0
Applicant's Proposed Action	High	IV	Yes	0.0
Variation S3-B1	*High*	*III*	*Yes*	*0.0*
Variation S3-B1	*High*	*IV*	*Yes*	*0.0*
Variation S3–B2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Moderate	Not applicable	Not applicable	Not applicable
5-26 Oregon Trail Area of Critical Environmental Concern–Hill Creek Road				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S3-C1	*Low*	*IV*	*Yes*	*0.0*
Variation S3-C2	*Low*	*IV*	*Yes*	*0.0*
Variation S3-C3	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	IV	Yes	0.0
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	IV	Yes	0.0
Flagstaff B – Burnt River West	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Moderate	Not applicable	Not applicable	Not applicable
5-29 Oregon Trail Crossing–Hixon Road				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S3-C1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	High	Not applicable	Not applicable	Not applicable

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Flagstaff B	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
5-30 Oregon Trail Crossing–Plano Road				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S3-C1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	High	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
5-31 Oregon Trail Crossing–Weatherby				
Applicant's Proposed Action	High	IV	Yes	0.0
Variation S3-C1	*High*	*IV*	*Yes*	*0.0*
Variation S3-C2	*High*	*IV*	*Yes*	*0.0*
Variation S3-C3	*High*	*IV*	*Yes*	*0.0*
Variation S3-C4	*High*	*IV*	*Yes*	*0.0*
Flagstaff A	High	IV	Yes	0.0
Timber Canyon	High	IV	Yes	0.0
Flagstaff A – Burnt River Mountain	High	IV	Yes	0.0
Flagstaff B	High	IV	Yes	0.0
5-32 Oregon Trail Kiwanis Club Memorial				
Applicant's Proposed Action	Low	III	Yes	0.0
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*Low*	*III*	*Yes*	*0.0*
Variation S3-B2	*Low*	*III*	*Yes*	*0.0*
Variation S3-B3	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Moderate	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Moderate	Not applicable	Not applicable	Not applicable

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
5-33 Oregon Trail Ruts Interpretive Site				
Applicant's Proposed Action	Moderate	III	Yes	0.0
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S3-B1	*Moderate*	*III*	*Yes*	*0.0*
Variation S3-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S3-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable
5-34 Powder River Area of Critical Environmental Concern				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff B – Burnt River West	Low	IV	Yes	0.0
5-36 Powder River Wild and Scenic River Corridor–Thief Valley Reservoir Road				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable
5-60 National Historic Oregon Trail Interpretive Center Entrance State Highway 86				
Applicant's Proposed Action	High	III	No	0.7
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S3-B1	*High`*	*III*	*No*	*0.7*
Variation S3-B1	*Moderate*	*IV*	*Yes*	*0.0*

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
5-81 Burnt River				
Flagstaff B – Burnt River West	High	II	No	0.8
Flagstaff B – Durkee	High	II	No	0.2
Variation S3-C5	*High*	*II*	*No*	*0.8*
Variation S3-C6	*High*	*II*	*No*	*0.2*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
5-82 Durkee Community				
Applicant's Proposed Action	Moderate	III	Yes	0.0
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S3-C1	*Moderate*	*III*	*Yes*	*0.0*
Variation S3-C1	*Moderate*	*IV*	*Yes*	*0.0*
Variation S3-C2	*Moderate*	*III*	*Yes*	*0.0*
Variation S3-C2	*Moderate*	*IV*	*Yes*	*0.0*
Variation S3-C3	*Low*	*III*	*Yes*	*0.0*
Variation S3-C3	*Low*	*IV*	*Yes*	*0.0*
Variation S3-C4	*Low*	*II*	*Yes*	*0.0*
Variation S3-C4	*Low*	*IV*	*Yes*	*0.0*
Variation S3-C5	*Low*	*II*	*Yes*	*0.0*
Variation S3-C5	*Low*	*IV*	*Yes*	*0.0*
Variation S3-C6	*Low*	*II*	*Yes*	*0.0*
Variation S3-C6	*Low*	*IV*	*Yes*	*0.0*
Flagstaff A	Low	II	Yes	0.0
Flagstaff A	Low	IV	Yes	0.0
Flagstaff A – Burnt River Mountain	Low	III	Yes	0.0
Flagstaff A – Burnt River Mountain	Low	IV	Yes	0.0
Flagstaff B	Low	III	Yes	0.0
Flagstaff B	Low	IV	Yes	0.0
Flagstaff B – Burnt River West	Low	II	Yes	0.0
Flagstaff B – Burnt River West	Low	IV	Yes	0.0
Flagstaff B – Durkee	Low	IV	Yes	0.0
Flagstaff B – Durkee	Low	II	Yes	0.0
5-84 BLM Virtue Flat Off-Highway Vehicle Recreation Areas				
Applicant's Proposed Action	Low	III	Yes	0.0
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S3-B1	*Low*	*III*	*Yes*	*0.0*
Variation S3-B1	*Low*	*IV*	*Yes*	*0.0*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
Linear Sensitive Viewing Platforms				
Alder Creek				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Flagstaff A	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	High	Not applicable	Not applicable	Not applicable
Daly Creek				
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Eagle Creek				
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Elkhorn Drive				
Variation S3–B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Grand Tour Route				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable
Grand Tour Scenic Bikeway				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S3–A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Flagstaff A	High	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	High	Not applicable	Not applicable	Not applicable
Flagstaff B	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
Hells Canyon				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S3-A1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	High	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	High	Not applicable	Not applicable	Not applicable
Flagstaff B	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
Interstate 84				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S3-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B3	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*High*	*Not applicable*	*Not applicable*	*Not applicable*

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Timber Canyon	Low	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
Journey Though Time Scenic Byway				
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Variation S3–B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Manning Creek Road				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Variation S3-C2	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Moderate	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Powder River Wild and Scenic River/Thief Valley Road				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable
Snake River-Mormon Basin Back Country Byway				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S3–A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Variation S3-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	High	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	High	Not applicable	Not applicable	Not applicable
Flagstaff B	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
Sparta Road				
Timber Canyon	High	Not applicable	Not applicable	Not applicable
State Highway 203				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S3–A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3–B3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	High	Not applicable	Not applicable	Not applicable
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	High	Not applicable	Not applicable	Not applicable
Flagstaff B	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	High	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	High	Not applicable	Not applicable	Not applicable
U.S. Forest Road 67-Big Creek				
Timber Canyon	High	Not applicable	Not applicable	Not applicable

Table 3-425. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 3—Baker Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
U.S. Forest Road 70				
Timber Canyon	High	Not applicable	Not applicable	Not applicable
U.S. Forest Road 250				
Timber Canyon	High	Not applicable	Not applicable	Not applicable
Special Management Areas				
Powder River Area of Critical Environmental Concern				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S3-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-B5	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	Low	Not applicable	Not applicable	Not applicable
Timber Canyon	Low	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	Low	Not applicable	Not applicable	Not applicable
Flagstaff B	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Burnt River West	Low	Not applicable	Not applicable	Not applicable
Flagstaff B – Durkee	Low	Not applicable	Not applicable	Not applicable

Table 3-426. Conformance with U.S. Forest Service Visual Quality Objectives for Visual Analysis Units in Segment 3—Baker Valley

Alternative Route	Visual Quality Objective	Conformance	Visual Quality Objectives met by the B2H Project	Acres of Disturbance	Percentage of Total Visual Quality Objective within Study Corridor
BA-013 Wallowa Mountains					
Timber Canyon	Preservation	Not applicable	Not applicable	0	0.0
	Retention	No	Maximum Modification	12	0.2
	Partial Retention	No	Maximum Modification	105	1.1
	Modification	No	Maximum Modification	427	1.0
	Maximum Modification	Yes	Maximum Modification	124	0.4

Conformance with USFS VQOs for VAUs is not applicable to the other alternatives and variations of Segment 3.

Applicant's Proposed Action Alternative

Effects on Landscape Character and Scenic Quality

Extending generally northwest to southeast, this alternative primarily crosses gently to steeply rolling sage steppe landscapes adjacent to flat or rolling agricultural valleys. Of the 10 VAUS visible within 5 miles of this alternative, 4 would have B scenic quality (Table 3-424). One VAU with B scenic quality (BA-025 Juniper and Sugarloaf Mountains) would experience high impacts on visible areas within the foreground through construction of the B2H Project in steep forested terrain, and one VAU with B scenic quality (BA-014 Blue and Wallowa Foothills) would experience moderate impacts on visible areas within the foreground. The latter would experience a change from B to C scenic quality within the visible foreground due to the introduction of cultural modifications incongruent with the existing setting.

Variation S3-A1

This route variation follows the same alignment through Links 3-4 and 3-22 as the Applicant's Proposed Action Alternative, through rolling hills that are associated with a B scenic quality. The B2H Project contrast associated with this variation would be predominately moderate, as the B2H Project would cross lands that are mostly undeveloped. As described for the Applicant's Proposed Action Alternative, this variation would result in a change from B to C scenic quality within the foreground of VAU BA-014 Blue and Wallowa Foothills.

Variation S3-A2

This route variation parallels Variation S3-A1 at a distance of less than 0.3 mile through Links 3-10, 3-14 and 3-20 and is colocated with an existing 230-kV transmission line. The project contrast associated with this variation would be predominately moderate impacts due to paralleling the existing transmission line that has modified the existing setting. Similar to Variation S3-A1, Variation S3-A2

would result in a change from B to C scenic quality within the foreground of VAU BA-014 Blue and Wallowa Foothills. However, this variation would result in less impact than Variation S3-A1 because it is colocated with an existing transmission line.

Variation S3-B1

This route follows the Applicant's Proposed Action Alternative alignment from Link 3-28 to 3-48, through mostly undeveloped, moderate to steeply rolling sage steppe hills with B and C scenic quality. The project contrast associated with this variation would generally vary from moderate to strong. Impacts on scenic quality associated with this variation would be high within areas of B scenic quality, and would lower the existing rating to C scenic quality within the visible foreground of VAU BA-014 Blue and Wallowa Foothills.

Variation S3-B2

This route variation is located west of Variation S3-B1, and would have a lesser impact on scenic quality because it is primarily colocated with an existing 230-kV transmission line along the east edge of Baker Valley throughout Link 3-37. The project contrast associated with this variation would be predominately moderate. Impacts on scenic quality associated with this variation would be high within areas of B scenic quality, and would lower the existing rating to C scenic quality within the visible foreground areas of VAU BA-014 Blue and Wallowa Foothills.

Variation S3-B3

Impacts associated with this variation would be similar to those discussed for Variation S3-B2, but would be colocated to a higher degree with an existing 230-kV transmission line through Link 3-37 and 3-44. Impacts on scenic quality would be slightly less than that of Variation S3-B2 since the adjacent existing transmission line has modified the existing landscape setting.

Variation S3-B4

Impacts associated with this variation would be similar to those discussed for Variation S3-B2, but would be colocated to a higher degree with an existing 230-kV transmission line through Link 3-31, 3-36, 3-37, 3-39, 3-43, and 3-44. Impacts on scenic quality would be slightly less than that of Variation S3-B2, Variation S3-B3, or Variation S3-B5 since the adjacent existing transmission line has modified the existing landscape setting.

Variation S3-B5

Impacts associated with this variation would be similar to those discussed for Variation S3-B2, but would be colocated to a higher degree with an existing 230-kV transmission line though Links 3-31, 3-34, and 3-39. Impacts on scenic quality would be slightly less than that of Variation S3-B2 or Variation S3-B3 since the adjacent existing transmission line has modified the existing landscape setting.

Variation S3-C1

This route follows the same alignment as the Applicant's Proposed Action Alternative from Link 3-58 to 3-92 through moderately to steeply rolling hills, both wide and narrow valleys, and moderately tall rolling mountains. Variation S3-C1 crosses both B and C scenic quality lands, and would be partially colocated

with existing 138-kV and existing 69-kV transmission lines. Of the 4 VAUS visible within 5 miles of this alternative, 2 would have B scenic quality (Table 3-424). The project contrast associated with this variation would be predominately high. Impacts on scenic quality associated with Variation S3-C1 would decrease the existing B scenic quality rating to C scenic quality within the visible foreground of VAU BA-014 Blue and Wallowa Foothills.

Variation S3-C2

Impacts associated with this variation would be similar to those discussed for Variation S3-C1, but would be colocated to a higher degree with existing 138-kV and 69-kV transmission lines through Link 3-42. Impacts on scenic quality would be slightly less than that of Variation S3-C1 since the adjacent existing transmission lines have modified the existing landscape setting..

Variation S3-C3

This route alignment is located west of the Applicant's Proposed Action Alternative and Variation S3-C1 - extending around the west side of the Durkee Valley. Variation S3-C3 crosses through moderately to steeply rolling hills, narrow valleys, and moderately tall rolling mountains associated with both B and C scenic quality. Of the 4 VAUS visible within 5 miles of this alternative, 2 would have B scenic quality (Table 3-424). The project contrast associated with this variation would be predominately high. Impacts on scenic quality associated with Variation S3-C3 would decrease the existing B scenic quality rating to C scenic quality within the visible foreground of VAU BA-014 Blue and Wallowa Foothills.

Variation S3-C4

Impacts on scenic quality associated with this variation would be similar to those described for Variation S3-C3, except that Variation S3-C4 through Link 3-70 would have more impacts on areas with B scenic quality as the B2H Project traverses steeper slopes increasing contrast introduced by construction of access roads.

Variation S3-C5

This route alignment would generally be located west of Variation S3-C4 - extending farther around the west side of the Durkee Valley through Links 3-71 and 3-73. Variation S3-C5 crosses through mostly undeveloped moderately to steeply rolling hills, narrow valleys, and moderately tall rolling mountains associated with both B and C scenic quality. Of the 4 VAUS visible within 5 miles of this alternative, 2 would have B scenic quality (Table 3-424). The project contrast associated with this variation would be predominately strong. Impacts on scenic quality associated with Variation S3-C5 would decrease the existing B scenic quality rating to C scenic quality within the visible foreground of VAU BA-014 Blue and Wallowa Foothills. Because Variation S3-C5 crosses through a higher amount of and steeper undeveloped land, the variation's impacts on scenery would be higher than that of Variation S3-C3 or S3-C4.

Variation S3-C6

This route alignment would generally be located further west and south of Variation S3-C5 - extending due south to Pedro Mountain before turning eastward and is the longest variation at 24.7 miles long. Variation S3-C6 crosses through mostly undeveloped moderately to steeply rolling hills, narrow valleys,

and moderately tall rolling mountains primarily associated with B scenic quality. Of the 4 VAUS visible within 5 miles of this alternative, 2 would have B scenic quality (Table 3-424). The project contrast associated with this variation would be predominately high, and in a greater amount than the Applicant's Proposed Action Alternative and all other associated variations. Impacts on scenic quality associated with Variation S3-C6 would decrease the existing B scenic quality rating to C scenic quality within the visible foreground of VAU BA-014 Blue and Wallowa Foothills. Because Variation S3-C6 crosses through a higher amount of undeveloped land with steeper forested slopes, the variation's impacts on scenery would be higher than that of Variation S3-C3, S3-C4, or S3-C5.

Effects on Views

Approximately 28.9 miles of high impacts and 17.6 miles of moderate impacts on views associated with residences, recreation, and travel routes would be correlated with the Applicant's Proposed Action Alternative.

Effects on Residential Views

The highest impacts on residential viewers would be concentrated in several different locations; the communities of Durkee, Weatherby, and Dixie, along with scattered residences along the I-84 corridor. Each of these areas would include residences within 0.5 mile of the Applicant's Proposed Action Alternative, resulting in continuous and occasionally skylined views of the B2H Project components within a setting of rolling sage steppe hills and mountains. Views from these residences would generally experience a high degree of impact. Impacts would be slightly less in areas where the Applicant's Proposed Action Alternative is colocated with existing 138-kV and 69-kV transmission lines that have modified the existing viewshed.

Variation S3-A1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative through rolling hills north of State Route 203. There are no residences within 0.5 mile of this route.

Variation S3-A2

This route would parallel the alignment of the Applicant's Proposed Action Alternative at a distance of less than 0.3 mile to the east. There are no residences within 0.5 mile of this route, and the highest impacts would be a moderate degree of impact on views from several residences from a distance over the 0.5 mile influence zone. This variation would result in a lesser degree of impact on views that Variation S3-A1 from residences because the variation alignment would closely parallel an existing 230-kV transmission line that has modified the existing viewshed.

Variation S3-B1

This route variation follows the same alignment of the Applicant's Proposed Action Alternative through rolling foothills, valleys, and drainages. There are no residences located less than 0.5 mile away from the route.

Variation S3-B2

This alternative is found west of the Applicant's Proposed Action Alternative through rolling foothills, valleys, and drainages, is within 0.5 mile of nine residences; however, the highest impacts on views would be from the 4 residences found near the northern section of the Variation S3-B2. The northernmost residences would have their views highly affected due unobstructed views of the B2H Project. For two residences located south of the residences mentioned above, located less 0.5 mile from the route, also would have high impacts on their views due to unobstructed views of the B2H Project partially skylined above ridgelines.

Variation S3-B3

This route variation is located west of the Applicant's Proposed Action Alternative through rolling foothills, valleys, and drainages and shares similar alignment to Variation S3-B2. The highest impacts associated with views from residences would occur on the same 4 residences found near the northern section of the variation S3-B2. This route variation is located closer to the southernmost residences and would moderately impact the views associated with these residences due to the proximity of the turning structures and the B2H Project being partially skylined.

Variation S3-B4

This route variation is located west of the Applicant's Proposed Action Alternative and the highest impacts associated with views from residences occur on the same four northern most residences as S3-B2 located less than 0.5 mile away from the B2H Project with similar moderate impacts on views associated with the southernmost residences as those from Variation S3-B3.

Variation S3-B5

This route variation would have similar high impacts on views associated with the same 4 northernmost residences as described for Variation S3-B2. This route variation also would have similar moderate impacts on views associated with the southernmost residences located less than 0.5 mile away from the route as those described for Variation S3-B2.

Variation S3-C1

This route variation follows the same alignment of the Applicant's Proposed Action Alternative through rolling foothills, valleys, and drainages. Although there are many residences that are located less than 0.5 mile away from the route, there are four major areas where these residences would have partially skylined and backdropped views due to the topography in this area. These areas include the communities of Durkee, Weatherby, and Dixie and areas along I-84.

Variation S3-C2

North of Durkee, this route variation begins to follow the same alignment of the Applicant's Proposed Action Alternative through rolling foothills, valleys, and drainages and turns slightly south just north of Durkee approximately mile away from Sensitive Viewing Platform 5-82 (Durkee Community) and turns east to meet the Applicant's Proposed Alignment Although there are many residences that are located less than 0.5 mile away from the route, there are four major areas where these residences would have partially skylined and backdropped views due to the topography in this area. Adjacent to the community

of Durkee, the B2H Project would be in closer to residences than Variation S3-C1 resulting in more intense impacts on their views.

Variation S3-C3

This route variation would have similar impacts as Variation S3-C1. This route would be less visible from residences as it would not be located within 0.5 mile of the residences described for Variations S3-C1 and S3-C2.

Variation S3-C4

Similar to Variation S3-C3, this route variation is located west of the community of Durkee but extends further to the west away from identified residences. This route follows the same alignment as the Applicant's Proposed Action Alternative on the east side of Weatherby.

Variation S3-C5

This route variation would affect views associated with three residences located less than 0.5 mile away from the B2H Project near the southern end of Segment 3 resulting in high impacts on these views

Variation S3-C6

Since this route variation is located west of most identified residences, impacts on views from three residences found at the southern end of Segment 3 would be high in magnitude as with views of the B2H Project mostly back dropped from an inferior viewing angle.

Effects on Recreational Views

There would be no identifiable impacts on stationary Sensitive Viewing Platforms associated with recreational views. The Applicant's Proposed Action Alternative would affect views from several linear viewing platforms that are either crossed or located less than 0.5 mile away from the B2H Project. This alternative crosses Hells Canyon All American Road and highly affect views due to the B2H Project crossing directly overhead through a mostly flat area surrounded by gentle rolling hills. The Grand Tour Scenic Bikeway, following State Highway 203, also would be affected by the B2H Project and would have a high impact on views due to unobstructed views of the B2H Project through a mostly flat landscape. Views from the Snake River-Mormon Basin Back Country Byway also would be affected by the B2H Project and would have similar impacts as Hells Canyon All American Road. There would be no identifiable impacts on SMAs that are associated with recreation. Note, impacts on the Oregon NHT and NHOTIC are described in Section 3.2.15.

Variation S3-A1

This route variation would have no identifiable impacts on views associated with recreation from stationary Sensitive Viewing Platforms, linear viewing platforms, or SMAs.

Variation S3-A2

This route variation would have no identifiable impacts on views associated with recreation from stationary Sensitive Viewing Platforms, linear viewing platforms, or SMAs.

Variations S3-B1 through S3-B5

These route variations would have the same impact levels on the three linear viewing platforms described for the Applicant's Proposed Action Alternative; however, S3-B1, crosses these routes through less developed land.

Variation S3-C1

This route would have no identifiable impacts on views associated with recreation for stationary Sensitive Viewing Platforms or SMAs. High impacts on views from the Snake River-Mormon Basin Back Country Byway would occur as this route crosses directly over the byway with unobstructed views of the B2H Project skylined in steep terrain.

Variations S3-C2 and S3-C3

Impacts on views from recreation viewers would be similar to Variation S3-C1.

Variation S3-C4

This route variation would moderately impact views from stationary Sensitive Viewing Platform 5-81 Burnt River as the B2H Project would be located less than 0.5 mile away. These views would be partially screened by vegetation and topography but where visible, the B2H Project would be partially skylined from an inferior viewing angle. This route variation would have similar impacts on views from the Snake River-Mormon Basin Back Country Byway as Variation S3-C1. This route would have no identifiable impacts on recreation views associated with SMAs.

Variation S3-C5

This route variation is located 0.2 mile from stationary Sensitive Viewing Platform 5-81 Burnt River generating high impacts on views due to the proximity to the site and the B2H Project being mostly skylined from an inferior viewing angle. This route would have similar impacts on views from the Snake River-Mormon Basin Back Country Byway linear viewing platform as Variation S3-C1.

Variation S3-C6

This route variation is located 0.7 mile from stationary Sensitive Viewing Platform 5-81 Burnt River generating high impacts on views due to the proximity to the site and the B2H Project being mostly skylined from an inferior viewing angle. This route variation would have similar impacts on the views from the Snake River-Mormon Basin Back Country Byway linear viewing platform as the Variation S3-C5. This route would have no identifiable impacts on recreation views associated with other stationary Sensitive Viewing Platforms or SMAs.

Effects on Views from Travel Routes

The highest impacts on travel routes would be associated with views from I-84 and Highway 203. Views from I-84 would be highly affected by the B2H Project, due to the overhead views of the crossing over I-84 as well as being located less than 0.25 mile away, since transmission line structures would be partially backdropped adjacent to existing cultural modifications. Views from Highway 203, as described for the Grand Tour Scenic Bikeway, would be highly affected by the B2H Project due to unobstructed views of the B2H Project through a mostly flat landscape.

Variations S3-A1 and S3-A2

The B2H Project would not be located less than 0.5 mile away from any identified travel routes.

Variation S3-B1

This route variation approaches I-84 at the southernmost end of the route variation where views would be moderately affected since the B2H Project would be seen in context with existing transmission lines which have modified the existing setting. This route variation would be the only route that would not parallel the travel route I-84. Views from Highway 203, as described for the Grand Tour Scenic Bikeway, would be highly affected by the B2H Project due to unobstructed views of the B2H Project through a mostly flat landscape.

Variation S3-B2

Views from I-84 would be moderately affected as the B2H Project would parallel the interstate adjacent to existing cultural modifications. High impacts on views from Highway 203 would occur due to head-on views of the B2H Project approximately 0.5 mile east of the existing 230-kV transmission line.

Variations S3-B3 and S3-B4

This route variation would have similar impacts on views from travel routes as Variation S3-B2 and shares the same alignment through Link 3-44.

Variation S3-B5

This route variation would have similar impacts on S3-B2 as it shares the same alignment through Link 3-47.

Variation S3-C1

Views from I-84 would be highly affected by the B2H Project, due to the overhead views of the crossing over I-84 as well as being located less than 0.25 mile away near the northern portion of the variation, since transmission line structures would be partially backdropped adjacent to existing cultural modifications.

Variation S3-C2

The route variation would highly impact views from I-84 due to a head-on view of the B2H Project directly adjacent to the highway where the proposed transmission line structures would be visually stacked in the viewshed increasing their dominance.

Variation S3-C3

This route variation would highly impact views from I-84 due to crossing I-84 three times with head-on views of the B2H Project where the proposed transmission line structures would be visually stacked in the viewshed increasing their dominance.

Variation S3-C4

Similar to Variation S3-C3, this route variation would introduce high impacts on views from I-84 due to crossing I-84 three times with head-on views of the B2H Project.

Variation S3-C5

Similar to Variation S3-C3, this route would introduce high impacts on views from I-84 due to crossing I-84 once near the northern end of the variation with head-on views of the B2H Project.

Variation S3-C6

This route variation would have similar impacts on views from I-84 as Variation S3-C5.

Conformance with Management Objectives

If the Applicant's Proposed Action Alternative is selected, the B2H Project would not be in conformance with BLM VRM Class Objectives adjacent to NHT-related Sensitive Viewing Platform 5-60 (National Historic Oregon Trail Interpretive Center Entrance State Highway 86) for 0.7 mile in VRM Class III. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Note: Variations not mentioned would be in conformance with BLM VRM Objectives and route does not cross USFS-administered land.

Variation S3-B1

Areas of non-conformance are the same as described for the Applicant's Proposed Action Alternative as they share the same alignment east of Sensitive Viewing Platform 5-60.

Variation S3-C5

This route variation would not be in conformance with VRM Class II for 0.8 mile as viewed from Sensitive Viewing Platform 5-81 (Burnt River Canyon). Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Variation S3-C6

This route variation would not be in conformance with VRM Class II for 0.2 mile as viewed from Sensitive Viewing Platform 5-81 (Burnt River Canyon). Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Flagstaff A Alternative

Effects on Landscape Character and Scenic Quality

Impacts associated with this alternative would be similar to that of the Applicant's Proposed Action Alternative, except the Flagstaff A Alternative follows the same alignment as Variation S3-B5 to the west of the NHOTIC facility, while the Applicant's Proposed Action Alternative follows the alignment of Variation S3-B1 to the east of the NHOTIC facility. Therefore, the Flagstaff A Alternative would have a lesser impact on scenic quality than the Applicant's Proposed Action Alternative because it would be primarily colocated with an existing 230-kV transmission line along the east edge of Baker Valley that has modified the adjacent areas through the presence of H-frame transmission line structures.

Effects on Views

The Flagstaff A Alternative would have 2.1 miles more of high impacts and 0.9 mile less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

Similar to the Applicant's Proposed Action Alternative, the highest impacts on residences would occur adjacent to communities as well as areas adjacent to I-84. Impacts on views from residences also would be similar to the Applicant's Proposed Action Alternative for most of the areas except Flagstaff A Alternative would have higher impacts in the proximity of residences east of Baker City.

Effects Recreational Views

Similar to the Applicant's Proposed Action Alternative, there would be no identifiable impacts on stationary Sensitive Viewing Platforms associated with recreational views. The Flagstaff A Alternative would affect views from several linear viewing platforms that are either crossed or located less than 0.5 mile away from the B2H Project. This alternative crosses Hells Canyon All American Road (State Highway 86) and highly impact views due to the crossing directly overhead through a mostly flat area surrounded by gentle rolling hills. Views from the Grande Tour Scenic Bikeway, following State Highway 203, also would be highly affected by the B2H Project due to unobstructed views of proposed transmission line structures in a mostly flat landscape. Views from the Snake River-Mormon Basin Back Country Byway would be similar to those impacts described for the Hells Canyon All American Road. There would be no identifiable impacts on views from SMAs that are associated with recreation. Note, impacts on the Oregon NHT and NHOTIC are described in Section 3.2.15.

Effects on Views Associated with Travel Routes

Impacts on views from travel routes would be similar to those described for the Applicant's Proposed Action Alternative.

Conformance with Management Objectives

The Flagstaff A Alternative does not cross USFS land. This alternative would be in conformance with objectives associated with BLM VRM Class lands crossed.

Timber Canyon Alternative

Effects on Landscape Character and Scenic Quality

The Timber Canyon Alternative would extend eastward, passing over rolling sage steppe hills to the north of Thief Valley Reservoir, and extending east and south into the forested, steeply rolling mountains of the Wallowa-Whitman National Forest. The alternative alignment would continue southward, passing through steeply rolling sage steppe hills to the east of Eagle Valley, before turning southwest and passing to the north of Big Lookout Mountain. Because this alternative traverses large expanses of undeveloped, steeply rolling hills of sage steppe and juniper, most of the 10 VAUs visible within 5 miles of this alternative are rated as B scenic quality (Table 3-424). Of these VAUs, one VAU has an A scenic quality rating, and 6 have B scenic quality ratings. The VAU with A scenic quality

includes densely forested steeply rolling mountains, and would be subjected to high impacts on scenery within the visible foreground due to geometrical forms generated through right-of-way vegetation clearing and the construction of access roads in steep terrain. The VAUs with B scenic quality would each be subjected to high levels of project contrast, resulting in high impacts in the visible foreground and moderate impacts in the visible middleground. From areas in which the B2H Project would be visible, each of the A and B scenic quality VAUs would experience decreases to the scenic quality rating scores. The decreases in scores would result in changes to the overall rating of B scenic quality for VAUs BA-022 Eagle Valley and BA-014 Blue and Wallowa Foothills.

Effects on Views

The Timber Canyon Alternative would have 27.4 miles more of high impacts and 7.4 miles less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

Impacts on views associated with residences occur in two major residential areas. At the south end of the alternative, west of Richland, views from residences would be highly affected due unobstructed views across the flat agricultural land crossed by the B2H Project. Approximately 1 mile north of New Bridge, impacts associated with views from residences in the valley would experience moderate impacts due to the inferior point of view with the transmission line structures being partially backdropped.

Effects on Recreational Views

There would be no identifiable impacts on views from stationary Sensitive Viewing Platforms or SMAs associated with recreation. There would be high impacts on views from linear viewing platforms associated with recreation, including head-on views from crossing the Grande Tour Scenic Bikeway, Grande Tour Route, the Snake River-Mormon Basin Back Country Byway, Powder River Wild and Scenic/Thief Valley Road, and Hells Canyon All American Road.

Effects on Views from Travel Routes

Views from Daly Creek, Eagle Creek, Manning Creek Road, Sparta Road, State Highway 203, USFS Road 67-Big Creek, USFS Road 70, and USFS Road 250 would all be highly affected by the B2H Project. Direct overhead crossing would occur to all three USFS roads through densely forested areas introducing a head-on views where the proposed transmission lines structures would be visually stacked against each other. The B2H Project would parallel Eagle Creek Road for approximately 3 miles at a distance of approximately 0.5 mile with views of partially skylined transmission line structures from an inferior viewing angle. Sparta Road would be paralleled by the B2H Project at a similar distances but also would be crossed at the southernmost end of the travel route. Both Manning Creek Road and Daly Creek Road also would both be crossed and would have similar views of the B2H Project, including partially skylined views of transmission line structures.

Conformance with Management Objectives

If the Timber Canyon Alternative is selected, the B2H Project would conform to all VRM Class objectives for BLM-administered lands. There would be areas of non-conformance on USFS-administered lands in the BA-013 Wallowa Mountains VAU and BA-014 Blue and Wallowa Foothills VAU. The areas of non-conformance with VQOs in the BA-013 Wallowa Mountains VAU established in Table 3-426 would include 21 acres of non-conformance with the Retention VQO and 18 acres of non-conformance with the Partial Retention VQO. Areas of non-conformance with the USFS Wallowa-Whitman National Forest LRMP are discussed in Section 3.4.

Flagstaff A – Burnt River Mountain Alternative

Effects on Landscape Character and Scenic Quality

Impacts associated with this alternative would be similar to that of the Flagstaff A Alternative, except the Flagstaff A – Burnt River Mountain Alternative follows the same alignment as Variation S3-C3, while the Flagstaff A Alternative follows the alignment of Variation S3-C1. Following the same alignment as Variation S3-C3, the Flagstaff A – Burnt River Mountain Alternative is located west of the Applicant's Proposed Action Alternative - extending around the west side of the Durkee Valley. In this area, the Flagstaff A – Burnt River Mountain Alternative is colocated with existing 138-kV and 69-kV transmission lines for fewer miles than the Applicant's Proposed Action Alternative – resulting in a higher degree of impacts on scenic quality as this alternative traverses more intact settings.

Effects on Views

The Flagstaff A – Burnt River Mountain Alternative would have 0.9 mile more of high impacts and 1.0 mile more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

Similar to the Applicant's Proposed Action Alternative, the highest impacts on residences would occur near Weatherby and Dixie as well as northeast of Baker City and areas adjacent to I-84. Impacts on these views also would be similar to the Applicant's Proposed Action Alternative except this alternative would not affect the residences near Durkee adjacent to I-84 but crosses three residences within 0.5 mile away west of Durkee.

Effects on Recreational Views

Similar to the Applicant's Proposed Action Alternative, there would be no identifiable impacts on stationary Sensitive Viewing Platforms associated with recreational views located less than 0.5 mile from the B2H Project. This alternative crosses the Hells Canyon All American Road and introduce high impacts on views due to the route crossing overhead through a mostly flat area surrounded by gentle rolling hills dominating the viewshed. Views from the Grande Tour Scenic Bikeway, following State Highway 203, also would be highly affected by the B2H Project due to unobstructed views of the B2H Project through a mostly flat landscape. Views from the Snake River-Mormon Basin Back Country Byway also would be affected by the B2H Project and would have similar impacts as described for the Hells Canyon All American Road. There would be no identifiable impacts on views from SMAs that are

associated with recreation. Note, impacts on the Oregon NHT and NHOTIC are described in Section 3.2.15.

Effects on Views from Travel Routes

Similar to the Applicant's Proposed Action Alternative, the highest impacts on travel routes would be associated with views from I-84 and State Highway 203. This route also would highly affect views from Alder Creek Road with head-on skylined views of the B2H Project. Views from I-84 would be highly affected by the B2H Project, due to the overhead views of the crossing over I-84 as well as being located less than 0.25 mile away, since transmission line structures would be partially backdropped adjacent to existing cultural modifications. Views from Highway 203, as described for the Grand Tour Scenic Bikeway, would be highly affected by the B2H Project due to unobstructed views of the B2H Project through a mostly flat landscape.

Conformance with Management Objectives

The Flagstaff A–Burnt River Mountain Alternative does not cross USFS land. This alternative would be in conformance with all objectives associated with BLM VRM Classes lands crossed.

Flagstaff B Alternative

Effects on Landscape Character and Scenic Quality

Impacts associated with this alternative would be similar to that of the Applicant's Proposed Action Alternative, except the Flagstaff B Alternative follows the same alignment as Variation S3-B3 to the west of the NHOTIC facility, while the Applicant's Proposed Action Alternative follows the alignment of Variation S3-B1 to the east of the NHOTIC facility. Since the Flagstaff B Alternative would be predominately colocated with an existing 230-kV transmission line along the east edge of Baker Valley, this alternative would have a less impacts on scenic quality than the Applicant's Proposed Action Alternative.

Effects on Views

The Flagstaff B Alternative would have 2.2 miles more of high impacts and 1.7 miles less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

Similar to the Applicant's Proposed Action Alternative, the highest impacts on residences would occur near Weatherby and Dixie as well as northeast of Baker City and areas adjacent to I-84. However, the Flagstaff B Alternative would be closer to Baker City, on the east side of the city, than the Applicant's Proposed Action Alternative. This route would increase the magnitude of impacts to views on residences of Baker City as well as the residences northeast of Baker City. The Flagstaff B Alternative would be within 0.5 mile from 3 residences in the area, and due to this. impacts on views from residences would be more than those of the Applicant's Proposed Action Alternative.

Effects on Recreational Views

There would be no identifiable impacts on views from stationary Sensitive Viewing Platforms associated with recreational views. This alternative would have impacts on views from several linear viewing platforms that are either crossed or located less than 0.5 mile away from the B2H Project. This alternative crosses the Hells Canyon All American Road and highly affect views due to crossing directly overhead through a mostly flat area surrounded by gentle rolling hills dominating the viewshed. Views from the Grand Tour Scenic Bikeway, following State Highway 203, also would be highly affected by the B2H Project due to unobstructed direct overhead views of the B2H Project through a mostly flat landscape. Views from the Snake River-Mormon Basin Back Country Byway also would be highly affected by the B2H Project, similar to the effects described for the Hells Canyon All American Road. There would be no identifiable impacts on views from SMAs that are associated with recreation. Note, impacts on the Oregon NHT and NHOTIC are described in Section 3.2.15.

Effects on Views from Travel Routes

The highest impacts on travel routes would be associated with views associated with I-84 and Highway 203.

Views from I-84 would be highly affected by the B2H Project, due to the overhead views of the crossing over I-84 as well as being located less than 0.25 mile away, since transmission line structures would be partially backdropped adjacent to existing cultural modifications. Views from Highway 203, as described for the Grand Tour Scenic Bikeway, would be highly affected by the B2H Project due to unobstructed views of the B2H Project through a mostly flat landscape.

Conformance with Management Objectives

The Flagstaff B Alternative does not cross USFS land. This alternative would be in conformance with all objectives associated with BLM VRM Classes lands crossed.

Flagstaff B – Burnt River West Alternative

Effects on Landscape Character and Scenic Quality

Impacts associated with this alternative would be similar to that of the Flagstaff B Alternative, except the Flagstaff B – Burnt River West Alternative follows the same alignment as Variation S3-C5, while the Flagstaff B Alternative follows the alignment of Variation S3-C1. Therefore, the Flagstaff B – Burnt River West Alternative is located west of the Applicant's Proposed Action Alternative - extending around the west side of the Durkee Valley. In this area, the Flagstaff B – Burnt River West Alternative traverses mostly undeveloped, steeply rolling hills and, on the southern end, is colocated with existing 138-kV and 69-kV transmission lines for fewer miles than the Flagstaff B Alternative, resulting in a higher degree of impacts on scenic quality.

Effects on Views

The Flagstaff B – Burnt River West Alternative would have 7.1 miles less of high impacts and 0.4 miles less of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

The highest impacts on residences would occur near Old U.S. Highway 30, west of I-84, Dixie, and northeast of Baker City. Impacts on views from residences would be similar to those described for the Applicant's Proposed Action Alternative. This alternative would not impact views from residences in Durkee as this alternative is sited west of the community.

Effects on Recreational Views

This alternative is located approximately 0.25 mile from Sensitive Viewing Platform 5-81 (Burnt River) and would highly impact these views due to the mostly unobstructed and skylined views of the B2H Project. This alternative would affect views from several linear viewing platforms that are either crossed or are located less than 0.5 mile from the B2H Project. This alternative crosses Hells Canyon All American Road and highly impact views due to the route crossing directly overhead through a mostly flat area surrounded by gentle rolling hills dominating the viewshed. Views from the Grand Tour Scenic Bikeway, following State Highway 203, also would be highly affected due to unobstructed direct overhead views of the B2H Project through a mostly flat landscape. Views from the Snake River-Mormon Basin Back Country Byway would also be highly affected by the B2H Project similar to those described for the Hells Canyon All American Road. There would be no identifiable impacts on views SMAs that are associated with recreation. Note, impacts on the Oregon NHT and NHOTIC are described in Section 3.2.15.

Effects on Views from Travel Routes

The highest impacts on travel routes would be associated with views from I-84 and State Highway 203. Views from I-84 would be highly affected by the B2H Project, due to the overhead views of the crossing over I-84 as well as being located less than 0.25 mile away, since transmission line structures would be partially backdropped adjacent to existing cultural modifications. Views from Highway 203, as described for the Grand Tour Scenic Bikeway, would be highly affected by the B2H Project due to unobstructed views of the B2H Project through a mostly flat landscape.

Conformance with Management Objectives

The Flagstaff B – Burnt River West Alternative does not cross USFS land. This alternative would not be in conformance with BLM VRM Class II Objectives for 0.8 mile as viewed from Sensitive Viewing Platform 5-81 Burnt River. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Flagstaff B – Durkee Alternative

Effects on Landscape Character and Scenic Quality

Impacts associated with this alternative would be similar to that of the Flagstaff B – Burnt River West Alternative, except the Flagstaff B – Durkee Alternative follows the same alignment as Variation S3-C6, while the Flagstaff B – Burnt River West Alternative follows the alignment of Variation S3-C5. Therefore, the Flagstaff B – Durkee Alternative is generally located farther west and south of the Flagstaff B – Burnt River West Alternative - extending due south to Pedro Mountain before turning eastward. In this area, the Flagstaff B – Durkee Alternative crosses through a higher amount of

undeveloped land with steeper forested slopes; therefore this alternative's impact on scenery would be higher than the Flagstaff B – Burnt River West Alternative.

Effects on Views

The Flagstaff B - Durkee Alternative would have 1.4 miles less of high impacts and 1.4 miles more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

The highest impacts on residences would occur near Old U.S. Highway 30, west of I-84, Dixie, and northeast of Baker City. Impacts on views from residences would be similar to those described for the Applicant's Proposed Action Alternative. This alternative would not impact views from residences in Durkee as this alternative is sited west of the community.

Effects on Recreational Views

The Flagstaff B – Durkee Alternative would not affect views from any stationary Sensitive Viewing Platforms with views located within 0.5 mile of the B2H Project. This alternative is located 0.7 mile from Sensitive Viewing Platform 5-81 (Burnt River) and would highly impact these views due to the mostly unobstructed and skylined views of the B2H Project. This alternative would affect views from several linear viewing platforms that are either crossed or are less than 0.5 mile away from the B2H Project. This alternative crosses Hells Canyon All American Road and highly impact views due to the route crossing directly overhead through a mostly flat area surrounded by gentle rolling hills dominating the viewshed. Views from the Grand Tour Scenic Bikeway, following State Highway 203, also would be highly affected due to unobstructed direct overhead views of the B2H Project through a mostly flat landscape. Views from the Snake River-Mormon Basin Back Country Byway also would be highly affected by the B2H Project where the route is crossed multiple times with head-on views of partially skylined to fully skylined transmission line structures. There would be no identifiable impacts on views from SMAs that are associated with recreation. Note, impacts on the Oregon NHT and NHOTIC are described in Section 3.2.15.

Effects on Views from Travel Routes

The highest impacts on travel routes would be associated with views from I-84 and State Highway 203. Unlike the Applicant's Proposed Action Alternative, this route only crosses I-84 once near the southernmost end of this alternative. Views from I-84 would be highly affected by the B2H Project, due to the overhead views of the crossing over I-84 as well as being located less than 0.25 mile away, since transmission line structures would be partially backdropped adjacent to existing cultural modifications. Views from Highway 203, as described for the Grand Tour Scenic Bikeway, would be highly affected by the B2H Project due to unobstructed views of the B2H Project through a mostly flat landscape.

Conformance with Management Objectives

The Flagstaff B – Durkee Alternative does not cross USFS land. This alternative would not be in conformance with BLM VRM Class II Objectives for 0.2 mile as viewed from Sensitive Viewing Platform

5-81 Burnt River. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Conclusions

Impacts associated with the alternatives and variations within Segment 3 vary based on the types of effects being considered (e.g. landscape character and scenic quality, types of viewers, and conformance with management objectives). Of the seven alternatives analyzed in Segment 3, the Timber Canyon Alternative would result in the highest level of impacts on landscape character and scenic quality—traversing a greater number of miles through undeveloped landscapes and landscapes with higher scenic quality ratings. The Flagstaff A and Flagstaff A – Burnt River Mountain alternatives cross a greater amount of agricultural lands with existing cultural modification, and would be partially colocated with existing 138-kV transmission lines.

Impacts on residential viewers would be highest along the I-84 corridor, near Baker City, Oregon, and near Richland, Oregon. In general, impacts on viewers would lessen with distance from the I-84 corridor. Thus, the Timber Canyon Alternative would have the least effects on viewers. Also, a greater number of recreational viewers have also been identified along the I-84 corridor, resulting in fewer effects predicted for the Timber Canyon Alternative as compared to other alternatives. Effects on viewers from travel routes generally would be similar among the various alternatives within Segment 3.

Segment 3 includes alternatives that would not conform to BLM and USFS management objectives. The Applicant's Proposed Action Alternative, Flagstaff B – Burnt River West, and Flagstaff B – Durkee alternatives would each include areas of non-conformance with BLM VRM Class Objectives. Likewise, both variations of the Flagstaff B – Durkee Alternative (S3-C5 and S3-C6) would not conform to BLM VRM Class Objectives. Non-conformance with USFS VQOs would occur in a number of areas along the Timber Canyon Alternative. The Flagstaff A, Flagstaff A – Burnt River Mountain, and Flagstaff B alternatives would conform with visual management objectives.

SEGMENT 4—BROGAN

The following narrative discussions describe the impacts associated with each alternative in Segment 4. Additional details regarding these analyses can be found in Table 3-427, Table 3-428, and Table 3-429. Table 3-428 presents the scenic quality impacts by VAU for each alternative route and route variation within Segment 4. This table includes the acreage within the foreground and middleground of each VAU that would have views of each alternative alignment. The existing scenic quality rating of each VAU also is included in this table, along with the residual scenic quality rating and score for both the foreground and middleground acreage. These residual scenic quality scores are based on the amount of change in score anticipated based on the criteria presented in Table 3-428.

Potential impacts on viewers are represented in Table 3-427 and Table 3-429. Table 3-427 presents an overall comparison of impacts on viewers, as measured in miles of high, moderate, and low impacts. The mileages of impacts are associated with the impacts as they relate back to the alignment of each alternative in Segment 4. This table also includes the total mileage of each alignment. Table 3-429

presents specific impacts anticipated from Sensitive Viewing Platforms, along with the status of conformance with BLM VRM objectives for BLM-related Sensitive Viewing Platforms within Segment 4. Each assessment of conformance also is accompanied by the length of the alternative that can be viewed crossing the associated BLM VRM Class(es).

Conformance with USFS VQOs are not presented in this segment as no USFS-administered land would be crossed by routes in Segment 4—Brogan.

At the end of this section is a conclusion of the impacts on Segment 4, which provides an overview of impacts as well as to which alternative routes and/or variations would be preferable. Because there are several facets to consider when analyzing potential impacts on visual resources (e.g. landscape character and scenic quality, viewers, and plan conformance), this overview provides preferences associated with each of those facets.

Table 3-427. Residual Impacts on Viewers for Segment 4—Brogan

Alternative Route	Total Length (miles)	Residual Impacts (miles)		
		High	Moderate	Low
Applicant's Proposed Action	40.1	7.1	9.0	24.0
Variation S4-A1	*5.9*	*3.5*	*2.4*	*0.0*
Variation S4-A2	*6.0*	*4.6*	*1.4*	*0.0*
Variation S4-A3	*6.1*	*4.7*	*1.4*	*0.0*
Tub Mountain South	40.5	18.7	18.2	3.6
Willow Creek	34.6	6.7	14.4	13.5

Table 3-428. Scenic Quality Impacts by Visual Analysis Unit for Segment 4—Brogan

Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-014 Blue and Wallowa Foothills								
Applicant's Proposed Action	6,938	33,115	B (12.0)	High	Moderate	C (10.5)	C (11.0)	40,053
Variation S4-A1	*2,664*	*27,928*	*B (12.0)*	*High*	*Moderate*	*C (10.5)*	*C (11.0)*	*30,592*
Variation S4-A2	*2,388*	*27,728*	*B (12.0)*	*Moderate*	*Moderate*	*C (11.0)*	*C (11.0)*	*20,508*
Variation S4-A3	*2,394*	*27,782*	*B (12.0)*	*Moderate*	*Moderate*	*C (11.0)*	*C (11.0)*	*30,176*
Tub Mountain South	5,047	27,066	B (12.0)	Moderate	Moderate	C (11.0)	C (11.0)	32,113
Willow Creek	6,094	28,051	B (12.0)	High	Moderate	C (10.5)	C (11.0)	34,145

Table 3-428. Scenic Quality Impacts by Visual Analysis Unit for Segment 4—Brogan								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
BA-025 Juniper and Sugarloaf Mountains								
Applicant's Proposed Action	425	26,626	B (17.5)	Moderate	Low	B (16.5)	B (17.5)	425
Variation S4-A1	*424*	*26,626*	*B (17.5)*	*Moderate*	*Low*	*B (16.5)*	*B (17.5)*	*424*
Variation S4-A2	*297*	*26,616*	*B (17.5)*	*Moderate*	*Low*	*B (16.5)*	*B (17.5)*	*297*
Variation S4-A3	*484*	*27,071*	*B (17.5)*	*Moderate*	*Low*	*B (16.5)*	*B (17.5)*	*484*
Tub Mountain South	297	27,005	B (17.5)	Moderate	Low	B (16.5)	B (17.5)	297
Willow Creek	424	26,996	B (17.5)	Moderate	Low	B (16.5)	B (17.5)	424
BA-027 Caribou Bar								
Applicant's Proposed Action	1,198	8,241	C (11.0)	High	Low	C (9.5)	C (11.0)	1,198
Variation S4-A1	1,178	8,261	C (11.0)	High	Low	C (9.5)	C (11.0)	1,178
Variation S4-A2	1,547	78,92	C (11.0)	High	Low	C (9.5)	C (11.0)	1,547
Variation S4-A3	1,392	8,087	C (11.0)	High	Low	C (9.5)	C (11.0)	1,392
Tub Mountain South	2,179	7,260	C (11.0)	High	Moderate	C (9.5)	C (10.0)	9,439
Willow Creek	1,198	8,241	C (11.0)	High	Low	C (9.5)	C (11.0)	1,198
BA-028 Brownlee Reservoir								
Applicant's Proposed Action	0	332	B (15.0)	No change	Low	B (15.0)	B (15.0)	0
Variation S4-A1	*0*	*322*	*B (15.0)*	*No change*	*Low*	*B (15.0)*	*B (15.0)*	*0*
Variation S4-A2	*0*	*322*	*B (15.0)*	*No change*	*Low*	*B (15.0)*	*B (15.0)*	*0*
Variation S4-A3	*0*	*322*	*B (15.0)*	*No change*	*Low*	*B (15.0)*	*B (15.0)*	*0*
Tub Mountain South	13	900	B (15.0)	Moderate	Low	B (14.0)	B (15.0)	13
Willow Creek	0	831	B (15.0)	No change	Low	B (15.0)	B (15.0)	0
BA-031 Phipps Creek								
Applicant's Proposed Action	0	484	C (10.0)	No change	Low	C (10.0)	C (10.0)	0
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	Not applicable							
Willow Creek	Not applicable							

Table 3-428. Scenic Quality Impacts by Visual Analysis Unit for Segment 4—Brogan								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
FR-025 Juniper and Sugarloaf Mountains								
Applicant's Proposed Action	0	322	Not applicable					
Variation S4-A1	*0*	*322*	*Not applicable*					
Variation S4-A2	*0*	*322*	*Not applicable*					
Variation S4-A3	*0*	*322*	*Not applicable*					
Tub Mountain South	0	3,702	Not applicable					
Willow Creek	0	958	Not applicable					
FR-028 Brownlee Reservoir								
Applicant's Proposed Action	0	651	Not applicable					
Variation S4-A1	*0*	*651*	*Not applicable*					
Variation S4-A2	*0*	*651*	*Not applicable*					
Variation S4-A3	*0*	*651*	*Not applicable*					
Tub Mountain South	<1	4,136	Not applicable					
Willow Creek	0	2,774	Not applicable					
MA-007 Cow Valley Butte								
Applicant's Proposed Action	0	210	C (10.0)	No change	Low	C (10.0)	C (10.0)	0
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	Not applicable							
Willow Creek	Not applicable							
MA-009 Becker Creek								
Applicant's Proposed Action	2,754	7,634	C (6.5)	High	Low	C (5.0)	C (6.5)	2,754
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	Not applicable							
Willow Creek	0	1,239	C (6.5)	No change	Low	C (6.5)	C (6.5)	0

Table 3-428. Scenic Quality Impacts by Visual Analysis Unit for Segment 4—Brogan								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
MA-011 Crow Creek								
Applicant's Proposed Action	370	1,154	B (13.0)	High	Low	C (11.5)	B (13.0)	370
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	Not applicable							
Willow Creek	Not applicable							
MA-012 Gum Creek								
Applicant's Proposed Action	10,541	26,457	C (9.5)	Moderate	Moderate	C (8.5)	C (8.5)	36,998
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	901	12,090	C (9.5)	High	Moderate	C (8.0)	C (8.5)	12,991
Willow Creek	1,411	18,502	C (9.5)	Moderate	Moderate	C (8.5)	C (8.5)	19,913
MA-013 Thorn Flat								
Applicant's Proposed Action	0	313	C (9.5)	No change	Low	C (9.5)	C (9.5)	0
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	Not applicable							
Willow Creek	Not applicable							
MA-015 Juniper Mountain								
Applicant's Proposed Action	48	10,324	C (10.0)	Low	Low	C (10.0)	C (10.0)	0
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	0	4,410	C (10.0)	No change	Low	C (10.0)	C (10.0)	0
Willow Creek	0	7,115	C (10.0)	No change	Low	C (10.0)	C (10.0)	0

Table 3-428. Scenic Quality Impacts by Visual Analysis Unit for Segment 4—Brogan								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
MA-038 Hope Butte								
Applicant's Proposed Action	2,204	32,575	C (10.0)	Moderate	Moderate	C (9.0)	C (9.0)	34,779
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	3,890	21,542	C (10.0)	High	Moderate	C (8.5)	C (9.0)	25,432
Willow Creek	4,459	29,047	C (10.0)	Moderate	Moderate	C (9.0)	C (9.0)	33,506
MA-039 Treasure Valley								
Applicant's Proposed Action	0	13,669	B (17.0)	No change	Low	B (17.0)	B (17.0)	0
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	2,675	22,723	B (17.0)	High	Low	C (15.5)	B (17.0)	2,675
Willow Creek	1,895	17,788	B (17.0)	High	Low	C (15.5)	B (17.0)	1,895
MA-040 Moores Hollow								
Applicant's Proposed Action	1,530	23,126	C (11.0)	Moderate	Low	C (9.5)	C (11.0)	1,530
Variation S4-A1	*0*	*466*	*C (11.0)*	*No change*	*Low*	*C (11.0)*	*C (11.0)*	*0*
Variation S4-A2	*0*	*466*	*C (11.0)*	*No change*	*Low*	*C (11.0)*	*C (11.0)*	*0*
Variation S4-A3	*0*	*466*	*C (11.0)*	*No change*	*Low*	*C (11.0)*	*C (11.0)*	*0*
Tub Mountain South	7,993	48,445	C (11.0)	High	Low	C (9.5)	C (11.0)	7,993
Willow Creek	6,967	49,490	C (11.0)	High	Low	C (9.5)	C (11.0)	6,967
MA-119 Danger Point								
Applicant's Proposed Action	0	10,756	B (12.0)	No change	Low	B (12.0)	B (12.0)	0
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	0	11,817	B (12.0)	No change	Moderate	B (12.0)	C (11.0)	11,817
Willow Creek	0	10,756	B (12.0)	No change	Low	B (12.0)	B (12.0)	0

Table 3-428. Scenic Quality Impacts by Visual Analysis Unit for Segment 4—Brogan								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
MA-120 Alkali Flats								
Applicant's Proposed Action	Not applicable							
Variation S4-A1	*Not applicable*							
Variation S4-A2	*Not applicable*							
Variation S4-A3	*Not applicable*							
Tub Mountain South	3,071	7,793	C (8.0)	Moderate	Low	C (7.0)	C (8.0)	3,071
Willow Creek	Not applicable							

Table 3-429. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 4—Brogan				
Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Stationary Sensitive Viewing Platforms				
5-5 Huntington Community				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S4-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A3	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Tub Mountain South	Moderate	IV	Yes	0.0
Willow Creek	Low	Not applicable	Not applicable	Not applicable
5-13 Farewell Bend State Recreation Area–Oregon Trail Boulevard				
Tub Mountain South	Moderate	III	Yes	0.0
	Moderate	IV	Yes	0.0
Willow Creek	Moderate	IV	Yes	0.0
5-59 Spring Wilderness Characteristic Area				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S4-A1	*Low*	*IV*	*Yes*	*0.0*
Variation S4-A2	*Low*	*IV*	*Yes*	*0.0*
Variation S4-A3	*Low*	*IV*	*Yes*	*0.0*
Tub Mountain South	Low	IV	Yes	0.0
Willow Creek	Low	IV	Yes	0.0

Table 3-429. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 4—Brogan

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
7-1 Weiser Dunes Bureau of Land Management Campsite				
Tub Mountain South	Low	III	Yes	0.0
	Low	IV	Yes	0.0
Willow Creek	Low	IV	Yes	0.0
7-6 Steck Park Bureau of Land Management Recreation Site				
Applicant's Proposed Action	Low	IV	Yes	0.0
Willow Creek	Low	IV	Yes	0.0
8-1 Alkali Springs Interpretive Site				
Tub Mountain South	Low	III	Yes	0.0
	Moderate	IV	Yes	0.0
8-3 Oregon Trail Area of Critical Environmental Concern–Birch Creek				
Tub Mountain South	High	III	No	1.7
	Low	IV	Yes	0
8-5 Bully Creek Reservoir				
Tub Mountain South	Moderate	III	Yes	0.0
	Low	IV	Yes	0
8-6 Community of Brogan				
Applicant's Proposed Action	Moderate	IV	Yes	0
Willow Creek	Low	Not applicable	Not applicable	Not applicable
8-8 Community of Jamieson				
Willow Creek	Moderate	Not applicable	Not applicable	Not applicable
8-34 South Alkali Sand Hills Area of Critical Environmental Concern				
Tub Mountain South	Low	III	Yes	0.0
	Low	IV	Yes	0.0
8-103 Tub Springs Interpretive Site				
Tub Mountain South	Low	III	Yes	0.0
	Low	IV	Yes	0.0
Linear Sensitive Viewing Platforms				
Interstate 84				
Applicant's Proposed Action	Moderate	Not applicable	Not applicable	Not applicable
Tub Mountain South	High	Not applicable	Not applicable	Not applicable
Willow Creek	Moderate	Not applicable	Not applicable	Not applicable
Variation S4-A1	*Moderate*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A3	*High*	*Not applicable*	*Not applicable*	*Not applicable*

Table 3-429. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 4—Brogan				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
Snake River-Mormon Basin Back Country Byway				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Tub Mountain South	High	Not applicable	Not applicable	Not applicable
Willow Creek	High	Not applicable	Not applicable	Not applicable
Variation S4-A1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A3	*High*	*Not applicable*	*Not applicable*	*Not applicable*
U. S. Highway 26				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Tub Mountain South	High	Not applicable	Not applicable	Not applicable
Willow Creek	High	Not applicable	Not applicable	Not applicable

Applicant's Proposed Action Alternative

Effects on Landscape Character and Scenic Quality

Extending generally to the southwest from the community of Huntington, until it meets with U.S. Highway 26 and turns to the southeast, the Applicant's Proposed Action Alterative crosses prominent rounded, sloping foothills with irregular converging drainages. This alternative traverses flat to soft rolling plains as well as smooth to rough mountains with jagged, and steep, rock outcrops. Of the thirteen VAUs visible within 5 miles of this alternative, five have a B scenic quality rating unit, and the rest have a C scenic quality rating. High impacts on occur on two VAUs, BA-014 Blue and Wallowa Foothills and MA-011 Cow Creek, where the B2H Project would dominate the landscape through the introduction of skylined transmission line structures. From areas in which the B2H Project would be visible, these VAUs also would experience decreases to the scenic quality rating scores. The decreases in scores would lower the scenic quality rating of VAUs BA-014 Blue and Wallowa Foothills and MA-011 Cow Creek from Class B to Class C.

Variation S4-A1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative through Links 4-11 and 4-13 traversing lands that are associated with Class B scenic quality and Class C scenic quality. High impacts would occur on VAU BA-014 Blue and Wallowa Foothills west of the Burnt River. Similar to the Applicant's Proposed Action Alternative, this variation would decrease the VAU's scenic quality rating score and lower the scenic quality rating from Class B to Class C.

Variation S4-A2

This route generally extends to the southeast approximately 0.1 mile east and parallel to Variation S4-A1. Similar to Variation S4-A1, this route crosses through lands that are associated with a Class B

scenic quality and Class C scenic quality. Moderate impacts would occur on VAU BA-014 Blue and Wallowa Foothills west of the Burnt River. Similar to the Applicant's Proposed Action Alternative, this variation would decrease the VAUs scenic quality rating score and lower the scenic quality rating from Class B to Class C.

Variation S4-A3

This route follows Variation S4-A1 for approximately 0.7 mile then crosses over and follows the same alignment as Variation S4-A2 and results in similar impacts on scenic quality as Variation S4-A2.

Effects on Views

Approximately 7.1 miles of high impacts and 9.0 miles of moderate impacts on views associated with residents, recreation, and travel routes would be associated with the Applicant's Proposed Action Alternative.

Effects on Residential Views

In general, the highest impacts on residential viewers would be concentrated in two locations where residences are located less than 0.5 mile of the route alignment. In the Community of Dixie, two residences would experience high impacts on their views, in context with a smaller existing transmission line, due to unobstructed views of skylined transmission line structures over rolling mountains with low growing vegetation. The two southern most residences near U.S. Highway 26, located less than 0.5 mile from the B2H Project, would have mostly backdropped and partially skylined views of the B2H Project resulting in moderate residual impacts. The residence located north of U.S. Highway 26 would have views of the B2H Project partially skylined from an inferior viewing angle in context with smaller existing transmission lines, resulting in high impacts since the B2H Project is larger in scale and would dominate these views.

Variation S4-A1

In the Community of Dixie, two residences would experience high impacts on their views, in context with a smaller existing transmission line, due to unobstructed views of skylined transmission line structures over rolling mountains with low growing vegetation.

Variations S4-A2 and S4-A3

Impacts on residential viewers are similar to Variation S4-A1.

Effects on Recreational Views

There would be no identifiable impacts on views from stationary Sensitive Viewing Platforms or SMAs associated with recreation along the Applicant's Proposed Action Alternative. There would be views affected along linear platforms associated with recreation use. Views of the B2H Project associated with recreation from the Snake River-Mormon Back Country Byway would include partially skylined transmission line structures approximately 0.25 mile away resulting in high impacts.

Variation S4-A1

There would be no identifiable impacts on views from stationary Sensitive Viewing Platforms or SMAs associated with recreation along Variation S4-A1. There would be views affected along linear platforms

associated with recreation use. Views of the B2H Project associated with recreation from the Snake River-Mormon Back Country Byway would include partially skylined transmission line structures approximately 0.25 mile away resulting in high impacts.

Variations S4-A2 and S4-A3

Impacts on views associated with recreation uses would be similar to Variation S4-A1.

Effects on Views from Travel Routes

The highest impacts on travel routes would be associated with U.S. Highway 26. This alternative crosses the travel route with viewers experiencing a head-on point of view of the B2H Project resulting in high residual impacts. Motorists on I-84 would have visibility of the B2H Project in context with a smaller existing transmission line. With the B2H Project 0.5 mile away from the travel route, the B2H Project would be partially visible due to topographic screening and would result in moderate residual impacts due to co-location with the existing line.

Variation S4-A1

As this route variation follows the same alignment through Links 4-1, 4-10, 4-11, and 4-13 as the Applicant's Proposed Action Alternative, Variation S4-A1 would have similar impacts on views from I-84. This variation is not visible from U.S. Highway 26.

Variation S4-A2

This variation would be approximately 0.25 mile away from I-84 and highly impact views associated with this travel route as views would include partially skylined transmission line structures closer to the interstate than the existing transmission line.

Variation S4-A3

Impacts on travel routes, including I-84, are similar to Variation S4-A2 as they share alignment through Link 4-17.

Conformance with Management Objectives

This route does not cross USFS land and is in conformance with all BLM VRM Class IV lands crossed.

Variation S4-A1

Similar to the Applicant's Proposed Action Alternative, this variation would be in conformance with all BLM VRM Class IV lands crossed and does not cross USFS lands.

Variation S4-A2

Similar to the Applicant's Proposed Action Alternative, this variation would be in conformance with all BLM VRM Class IV lands crossed and does not cross USFS lands.

Variation S4-A3

Similar to the Applicant's Proposed Action Alternative, this variation would be in conformance with all BLM VRM Class IV crossed and does not cross USFS lands.

Tub Mountain South Alternative

Effects on Landscape Character and Scenic Quality

Extending generally to the south until reaching the Oregon Trail ACEC, the Tub Mountain South Alternative turns west and the heads west across prominent rounded, sloping foothills with irregular converging drainages. This alternative also crosses flat to soft rolling plains as well slightly rolling flatlands. Of the ten VAUs visible within 5 miles of this alternative, four have a B scenic quality rating unit, and the rest have a C scenic quality rating. High impacts would occur on VAU MA-039 Treasure Valley with a Class B rating. From areas in which the B2H Project would be visible, the VAUs would experience decreases in scenic quality rating scores. The decreases in scores associated with high impacts on MA-039 Treasure Valley and moderate impacts in BA-014 Blue and Wallowa Foothills and MA-119 Danger Point would result in their scenic quality rating dropping from Class B to Class C.

Effects on Views

The Tub Mountain South Alternative would have 11.6 miles more of high impacts and 9.2 miles more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

In the Community of Dixie, two residences would experience high impacts on their views, in context with a smaller existing transmission line, due to unobstructed views of skylined transmission line structures over rolling mountains with low growing vegetation. Residences located southeast of Willow Creek, less than 0.5 mile from this alternative, would experience high impacts on their views due to the unobstructed views across flat agricultural land where the B2H Project would dominate the viewshed.

Effects on Recreational Views

There are no views associated with recreation within 0.5 mile of this alternative.

Effects on Views from Travel Routes

This route approaches within 0.25 mile of I-84 and would generate high impacts on views associated with this travel route due to views of partially skylined transmission line structures. This alternative crosses U.S. Highway 26 with unobstructed views of a head-on point of view of the B2H Project and result in high residual impacts through mostly flat agricultural lands where the B2H Project would dominate the viewshed.

Conformance with Management Objectives

The Tub Mountain South Alternative does not cross USFS land, and is in conformance with all BLM VRM Class IV crossed. Views from NHT-related Sensitive Viewing Platform 8-3 (Oregon Trail Area of Critical Environmental Concern–Birch Creek) would include 1.7 miles where the B2H Project would not meet VRM Class III objectives. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Willow Creek Alternative

Effects on Landscape Character and Scenic Quality

Extending generally to the southwest until it meets with U.S. Highway 26 then extends to the south, this alternative crosses prominent rounded, sloping foothills with irregular converging drainages. It also crosses flat to soft rolling plains as well as smooth to rough mountains with jagged, and steep, rock outcrops. Of the ten VAUs visible within 5 miles of this alternative, four have a B scenic quality rating unit and the rest have a C scenic quality rating. High impacts would occur on two VAUs rated as Class B, BA-014 Blue and Wallow Foothills and MA-039 Treasure Valley. From areas in which the B2H Project would be visible, VAUs would experience decreases in scenic quality rating scores. The decreases in scores would lower the scenic quality rating of VAUs BA-014 Blue and Wallow Foothills and MA-039 Treasure Valley from Class B to Class C.

Effects on Views

The Willow Creek Alternative would have 0.4 miles less of high impacts and 5.4 miles more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

This alternative would have its highest impacts on residential viewers in two general areas. High impacts on views associated with residences in Dixie would be similar to those described for the Applicant's Proposed Action Alternative. Residences located northwest of Jamieson, less than 0.5 mile from this alternative, would have their views highly affected due to unobstructed views across flat agricultural lands where the B2H Project would dominate the viewshed.

Effects on Recreational Views

Similar to the Applicant's Proposed Action Alternative through Link 4-1, there would be no identifiable impacts on views from stationary Sensitive Viewing Platforms or SMAs associated with recreation uses along this alternative. There would be views affected along linear platforms associated with recreation use. Views of the B2H Project from the Snake River-Mormon Back Country Byway would include partially skylined transmission line structures located approximately 0.25 mile away resulting in high impacts.

Effects on Views from Travel Routes

Impacts on views from travel routes would be similar to those associated with the Applicant's Proposed Action Alternative.

Conformance with Management Objectives

The Willow Creek Alternative does not cross USFS land, and would be conformance with all BLM VRM Class IV lands crossed.

Conclusions

Impacts associated with the alternatives and variations within Segment 4 vary based on the types of effects being considered (e.g. landscape character and scenic quality, types of viewers, and

conformance with management objectives). The highest impacts on landscape character and scenic quality would be associated with the Applicant's Proposed Action Alternative because this alignment crosses the greatest amount of undeveloped landscape. The Tub Mountain South Alternative would result in the least amount of impact on landscape character and scenic quality. This alignment is colocated with existing transmission lines for the greatest distance and traverses a slightly greater amount of agricultural and ranching landscapes that include existing cultural modifications. However, the Tub Mountain South Alternative would result in the highest impacts on viewers. While the Willow Creek Alternative would have the least amount of impact on viewers using travel routes, the Applicant's Proposed Action Alternative would result in the least amount of impacts on both residential and recreational viewers.

The Tub Mountain South Alternative would result in non-conformance with BLM VRM Classes in the vicinity of KOP 8-3. The Applicant's Proposed Action Alternative and Willow Creek alternatives would conform to management objectives.

SEGMENT 5—MALHEUR

The following narrative discussions describe the impacts associated with each alternative in Segment 5. Additional details regarding these analyses can be found in Table 3-430, Table 3-431, and Table 3-432. Table 3-431 presents the scenic quality impacts by VAU for each alternative route and route variation within Segment 5. This table includes the acreage within the foreground and middleground of each VAU that would have views of each alternative alignment. The existing scenic quality rating of each VAU also is included in this table, along with the residual scenic quality rating and score for both the foreground and middleground acreage. These residual scenic quality scores are based on the amount of change in score anticipated based on the criteria presented in Table 3-431.

Potential impacts on viewers are represented in Table 3-430 and Table 3-432. Table 3-430 presents an overall comparison of impacts on viewers, as measured in miles of high, moderate, and low impacts. The mileages of impacts are associated with the impacts as they relate back to the alignment of each alternative in Segment 5. This table also includes the total mileage of each alignment. Table 3-432 presents specific impacts anticipated from Sensitive Viewing Platforms, along with the status of conformance with BLM VRM objectives for BLM-related Sensitive Viewing Platforms within Segment 5. Each assessment of conformance also is accompanied by the length of the alternative that can be viewed crossing the associated BLM VRM Class(es).

Conformance issues with USFS VQOs are not presented in this segment. USFS is not affected by Segment 5—Malheur.

At the end of this section is a conclusion of the impacts on Segment 5, which provides an overview of impacts as well as to which alternative routes and/or variations would be preferable. Because there are several facets to consider when analyzing potential impacts on visual resources (e.g. landscape character and scenic quality, viewers, and plan conformance), this overview provides preferences associated with each of those facets.

Table 3-430. Residual Impacts on Viewers for Segment 5—Malheur				
Alternative Route	**Total Length (miles)**	**Residual Impacts (miles)**		
		High	**Moderate**	**Low**
Applicant's Proposed Action	40.4	8.7	10.8	20.9
Variation S5-A1	*7.4*	*0.9*	*0.4*	*6.1*
Variation S5-A2	*7.4*	*2.3*	*2.3*	*2.8*
Variation S5-B1	*2.5*	*2.1*	*0.4*	*0.0*
Variation S5-B2	*2.8*	*2.1*	*0.7*	*0.0*
Malheur S	43.5	9.2	13.4	20.9
Malheur A	43.1	8.1	15.8	19.2

Table 3-431. Scenic Quality Impacts by Visual Analysis Unit for Segment 5—Malheur								
Alternative Route	**Acres Visible**		**Existing Scenic Quality Class (Rating)**	**Residual Impact Level**		**Residual Scenic Quality Class (Rating)**		**Total Change in Scenic Quality Rating (in acres)**
	Foreground	**Middleground**		**Foreground**	**Middleground**	**Foreground**	**MIddleground**	
MA-012 Gum Creek								
Applicant's Proposed Action	1,878	11,113	C (9.0)	High	Low	C (7.5)	C (9.0)	1,878
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	1,878	11,113	C (9.0)	High	Low	C (7.5)	C (9.0)	1,878
Malheur A	1,878	11,113	C (9.0)	High	Low	C (7.5)	C (9.0)	1,878
MA-015 Juniper Mountain								
Applicant's Proposed Action	0	4,457	B (14.5)	No change	Low	B (14.5)	B (14.5)	0
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	0	4,457	B (14.5)	No change	Low	B (14.5)	B (14.5)	0
Malheur A	0	4,457	B (14.5)	No change	Low	B (14.5)	B (14.5)	0
MA-038 Hope Butte								
Applicant's Proposed Action	0	14,399	C (10.0)	No change	Low	C (10.0)	C (10.0)	0
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							

Table 3-431. Scenic Quality Impacts by Visual Analysis Unit for Segment 5—Malheur								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Malheur S	0	14,399	C (10.0)	No change	Low	C (10.0)	C (10.0)	0
Malheur A	0	14,399	C (10.0)	No change	Low	C (10.0)	C (10.0)	0
MA-039 Treasure Valley								
Applicant's Proposed Action	528	42,217	B (17.0)	High	Moderate	B (15.5)	B (16.0)	42,745
Variation S5-A1	*0*	*10,072*	*B (17.0)*	*No change*	*Low*	*B (17.0)*	*B (17.0)*	*0*
Variation S5-A2	*0*	*7,211*	*B (17.0)*	*No change*	*Low*	*B (17.0)*	*B (17.0)*	*0*
Variation S5-B1	*487*	*15,628*	*B (17.0)*	*High*	*Moderate*	*B (15.5)*	*B (16.0)*	*16,115*
Variation S5-B2	*975*	*15,263*	*B (17.0)*	*High*	*Moderate*	*B (15.5)*	*B (16.0)*	*16,238*
Malheur S	0	20,158	B (17.0)	No change	Low	B (17.0)	B (17.0)	0
Malheur A	0	18,500	B (17.0)	No change	Low	B (17.0)	B (17.0)	0
MA-041 Sourdough Basin								
Applicant's Proposed Action	13,382	56,660	C (9.5)	High	Moderate	C (8.0)	C (8.5)	70,042
Variation S5-A1	*5,221*	*50,426*	*C (9.5)*	*High*	*Moderate*	*C (8.0)*	*C (8.5)*	*55,647*
Variation S5-A2	*5,223*	*52,290*	*C (9.5)*	*High*	*Moderate*	*C (8.0)*	*C (8.5)*	*57,513*
Variation S5-B1	*0*	*11,968*	*C (9.5)*	*No change*	*Moderate*	*C (9.5)*	*C (8.5)*	*11,968*
Variation S5-B2	*0*	*11,968*	*C (9.5)*	*No change*	*Moderate*	*C (9.5)*	*C (8.5)*	*11,968*
Malheur S	9,825	60,571	C (9.5)	High	Moderate	C (8.0)	C (8.5)	70,396
Malheur A	9,991	58,986	C (9.5)	High	Moderate	C (8.0)	C (8.5)	68,977
MA-044 Westfall/Harper Valley								
Applicant's Proposed Action	0	2,472	B (12.0)	No change	Low	B (12.0)	B (12.0)	0
Variation S5-A1	*0*	*1,402*	*B (12.0)*	*No change*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S5-A2	*0*	*1,402*	*B (12.0)*	*No change*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	0	2,472	B (12.0)	No change	Low	B (12.0)	B (12.0)	0
Malheur A	0	2,472	B (12.0)	No change	Low	B (12.0)	B (12.0)	0
MA-058 Hoodoo Ridge								
Applicant's Proposed Action	0	11,806	C (8.5)	No change	Low	C (8.5)	C (8.5)	0
Variation S5-A1	*0*	*13,123*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S5-A2	*0*	*13,123*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							

Table 3-431. Scenic Quality Impacts by Visual Analysis Unit for Segment 5—Malheur								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Malheur S	5,168	26,944	C (8.5)	High	Moderate	C (7.0)	C (8.5)	32,112
Malheur A	5,168	26,944	C (8.5)	High	Moderate	C (7.0)	C (8.5)	32,112
MA-059 Grassy Mountain								
Applicant's Proposed Action	Not applicable							
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	0	3,992	B (11.5)	No change	Low	B (11.5)	B (11.5)	0
Malheur A	40	3,955	B (11.5)	Low	Low	B (11.5)	B (11.5)	0
MA-060 Owyhee Tunnel								
Applicant's Proposed Action	3,353	19,760	B (11.5)	High	Low	C (9.0)	B (11.5)	3,353
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*1,475*	*17,900*	*B (11.5)*	*High*	*Low*	*C (9.0)*	*B (11.5)*	*1,475*
Variation S5-B2	*1,184*	*18,159*	*B (11.5)*	*High*	*Low*	*C (9.0)*	*B (11.5)*	*1,184*
Malheur S	4,203	19,582	B (11.5)	High	Moderate	C (9.0)	C (10.5)	23,785
Malheur A	3,340	16,326	B (11.5)	High	Moderate	C (9.0)	C (10.5)	19,666
MA-073 Iron Mountain								
Applicant's Proposed Action	Not applicable							
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	0	2,833	A (21.0)	No change	Moderate	A (21.0)	A (20.0)	2,833
Malheur A	0	3,620	A (21.0)	No change	Low	A (21.0)	A (21.0)	0
MA-074 Board Coral								
Applicant's Proposed Action	0	2,503	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							

Table 3-431. Scenic Quality Impacts by Visual Analysis Unit for Segment 5—Malheur								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Malheur S	267	5,137	C (10.5)	High	Moderate	C (9.0)	C (9.5)	5,404
Malheur A	930	4,665	C (10.5)	High	High	C (9.0)	C (9.0)	5,595
MA-075 North Alkali								
Applicant's Proposed Action	4,436	19,507	C (8.5)	High	Moderate	C (7.0)	C (7.5)	23,943
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*0*	*3,726*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S5-B2	*0*	*3,726*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Malheur S	3,168	21,030	C (8.5)	High	Moderate	C (7.0)	C (7.5)	24,198
Malheur A	2,846	21,619	C (8.5)	High	Moderate	C (7.0)	C (7.5)	24,465
MA-077 Antelope Springs								
Applicant's Proposed Action	0	7,163	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	0	7,163	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Malheur A	0	7,163	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
MA-078 Succor Creek								
Applicant's Proposed Action	48	894	A (19.0)	Low	Low	A (19.0)	A (19.0)	0
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	48	894	A (19.0)	Moderate	Low	B (18.0)	A (19.0)	48
Malheur A	48	894	A (19.0)	Moderate	Low	B (18.0)	A (19.0)	48
MA-119 Danger Point								
Applicant's Proposed Action	2,248	20,916	B (12.0)	High	Low	C (10.5)	B (12.0)	2,248
Variation S5-A1	*0*	*11,383*	*B (12.0)*	*No change*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S5-A2	*0*	*11,383*	*B (12.0)*	*No change*	*Low*	*B (12.0)*	*B (12.0)*	*0*
Variation S5-B1	*Not applicable*							
Variation S5-B2	*0*	*850*	*B (12.0)*	*No change*	*Low*	*B (12.0)*	*B (12.0)*	*0*

Table 3-431. Scenic Quality Impacts by Visual Analysis Unit for Segment 5—Malheur								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Malheur S	2,248	20,916	B (12.0)	High	Low	C (10.5)	B (12.0)	2,248
Malheur A	2,248	20,916	B (12.0)	High	Low	C (10.5)	B (12.0)	2,248
MA-121 Big Sage Flat								
Applicant's Proposed Action	0	2,695	B (13.0)	No change	Low	B (13.0)	B (13.0)	0
Variation S5-A1	*0*	*1,084*	*B (13.0)*	*No change*	*Low*	*B (13.0)*	*B (13.0)*	*0*
Variation S5-A2	*0*	*1,084*	*B (13.0)*	*No change*	*Low*	*B (13.0)*	*B (13.0)*	*0*
Variation S5-B1	*0*	*771*	*B (13.0)*	*No change*	*Low*	*B (13.0)*	*B (13.0)*	*0*
Variation S5-B2	*Not applicable*							
Malheur S	Not applicable							
Malheur A	Not applicable							
MA-122 Owyhee River								
Applicant's Proposed Action	166	2,973	A (19.0)	High	Low	B (17.5)	A (19.0)	166
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*166*	*2,691*	*A (19.0)*	*High*	*Low*	*B (17.5)*	*A (19.0)*	*166*
Variation S5-B2	*105*	*2,633*	*A (19.0)*	*Moderate*	*Low*	*B (18.0)*	*A (19.0)*	*105*
Malheur S	1,233	4,655	A (19.0)	High	Low	B (17.5)	A (19.0)	1,233
Malheur A	1,220	4,072	A (19.0)	High	Low	B (17.5)	A (19.0)	1,220
OW-001 Owyhee Mountains								
Applicant's Proposed Action	0	1,339	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							
Malheur S	0	1,339	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Malheur A	0	1,339	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
OW-019 Treasure Valley								
Applicant's Proposed Action	0	7,802	B (13.5)	No change	Low	B (13.5)	B (13.5)	0
Variation S5-A1	*Not applicable*							
Variation S5-A2	*Not applicable*							
Variation S5-B1	*Not applicable*							
Variation S5-B2	*Not applicable*							

Table 3-431. Scenic Quality Impacts by Visual Analysis Unit for Segment 5—Malheur

Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Malheur S	0	7,228	B (13.5)	No change	Low	B (13.5)	B (13.5)	0
Malheur A	0	6,741	B (13.5)	No change	Low	B (13.5)	B (13.5)	0

Table 3-432. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 5—Malheur

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Stationary Sensitive Viewing Platforms				
8-4 Buck Gulch Proposed Wilderness Study Area				
Applicant's Proposed Action	Low	IV	Yes	0.0
Malheur S	Low	IV	Yes	0.0
Malheur A	High	IV	Yes	0.0
8-18 Lake Owyhee State Park				
Malheur S	Low	III	Yes	0.0
8-21 McIntyre Ridge Proposed Wilderness Study Area				
Malheur A	Low	IV	Yes	0.0
8-33 Double Mountain Wilderness Characteristic Inventory Unit – Twin Spring Road North				
Applicant's Proposed Action	High	IV	Yes	0.0
Variation S5-A1	*High*	*IV*	*Yes*	*0.0*
Variation S5-A2	*High*	*IV*	*Yes*	*0.0*
8-51 Big Bend Launch Site				
Applicant's Proposed Action	Low	IV	Yes	0.0
Malheur S	Low	IV	Yes	0.0
Malheur A	Low	IV	Yes	0.0
8-52 Lower Owyhee Interpretive Site				
Applicant's Proposed Action	High	II	No	0.5
Variation S5-B1	*High*	*II*	*No*	*0.5*
Variation S5-B2	*Low*	*III*	*Yes*	*0.0*
Malheur S	None	Not applicable	Not applicable	Not applicable
Malheur A	None	Not applicable	Not applicable	Not applicable
8-74 McIntyre Ridge Wilderness Characteristic Area – Succor Creek Road				
Malheur S	Low	IV	Yes	0.0
Malheur A	Low	IV	Yes	0.0

Table 3-432. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 5—Malheur

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
8-84 Burnt Mountain Wilderness Characteristic Area – Old Mormon hand cart trail				
Malheur S	Low	IV	Yes	0.0
Malheur A	High	II	No	1.1
8-85 Sourdough Mountain Wilderness Characteristic Area – Twin Spring Road				
Malheur S	High	IV	Yes	0.0
Malheur A	High	IV	Yes	0.0
8-88 Broken Rim Wilderness Characteristic Area – Hoo Doo Road North				
Applicant's Proposed Action	Low	Not applicable	Not applicable	Not applicable
Variation S5-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-A2	*Low*	*IV*	*Yes*	*0.0*
Malheur S	High	IV	Yes	0.0
Malheur A	High	IV	Yes	0.0
8-90 Double Mountain Wilderness Characteristic Inventory Unit – Negro Rock Creek North				
Applicant's Proposed Action	Low	III	Yes	0.0
	Low	IV	Yes	0.0
Variation S5-A1	*Low*	*IV*	*Yes*	*0.0*
Variation S5-A2	*High*	*IV*	*Yes*	*0.0*
Malheur S	Low	III	Yes	0.0
	Low	IV	Yes	0.0
Malheur A	Low	III	Yes	0.0
	Low	IV	Yes	0.0
8-91 Double Mountain Wilderness Characteristic Inventory Unit – Twin Spring Road South				
Malheur S	Low	III	Yes	0.0
	Low	IV	Yes	0.0
Malheur A	Low	III	Yes	0.0
	Low	IV	Yes	0.0
8-93 Double Mountain Wilderness Characteristic Inventory Unit – Negro Rock Creek Middle				
Malheur S	Low	IV	Yes	0.0
Malheur A	Low	IV	Yes	0.0
8-94 Double Mountain Wilderness Characteristic Inventory Unit – Negro Rock Creek South				
Malheur S	High	IV	Yes	0.0
Malheur A	High	IV	Yes	0.0
8-95 Owyhee Canyon Recreation Site				
Malheur S	Low	II	Yes	0.0
Malheur S	Low	IV	Yes	0.0
Malheur A	High	II	No	0.8

Table 3-432. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 5—Malheur

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
8-96 Owyhee River Recreation Site				
Malheur S	Moderate	II	No	0.7
Malheur A	Moderate	II	No	0.6
8-102 Succor Creek Rural Area				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Malheur S	Moderate	IV	Yes	0.0
Malheur A	Moderate	IV	Yes	0.0
13-1 Owyhee Wild and Scenic River				
Applicant's Proposed Action	High	II	No	1.5
	High	III	No	0.3
	Low	IV	Yes	0.0
Variation S5-B1	*High*	*II*	*No*	*1.1*
	High	*III*	*No*	*0.3*
	Low	*IV*	*Yes*	*0.0*
Variation S5-B2	*Moderate*	*II*	*No*	*0.1*
	Moderate	*III*	*Yes*	*0.0*
Linear Sensitive Viewing Platforms				
Mitchell Butte Road				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S5-B1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-B2	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Malheur A	Low	Not applicable	Not applicable	Not applicable
Malheur S	Low	Not applicable	Not applicable	Not applicable
Owyhee River Canyon Road				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S5-B1	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-B2	*High*	*Not applicable*	*Not applicable*	*Not applicable*
Malheur A	High	Not applicable	Not applicable	Not applicable
Malheur S	High	Not applicable	Not applicable	Not applicable
U.S. Highway 20				
Applicant's Proposed Action	High	Not applicable	Not applicable	Not applicable
Variation S5-A1	*Low*	*Not applicable*	*Not applicable*	*Not applicable*
Malheur A	High	Not applicable	Not applicable	Not applicable
Malheur S	High	Not applicable	Not applicable	Not applicable

Applicant's Proposed Action Alternative

Effects on Landscape Character and Scenic Quality

Extending generally to the southeast the Applicant's Proposed Action Alternative crosses prominent, smooth to rough foothills with steeply sloping, contrasting rock outcrops. The alternative also crosses rolling, flat-topped buttes with horizontal rock bands and tops; incised drainages adjacent to Owyhee River, flat to soft rolling plains, and smooth to rough mountains with jagged, and steep, rock outcrops. Of the seventeen VAUs visible within 5 miles of this alternative, one has a Class A scenic quality rating, seven have a B scenic quality rating, and the rest have a C scenic quality rating. Impacts on the Class A VAU, MA-078 Succor Creek would be low in magnitude. High impacts would occur on 4 Class B VAUs (MA-039 Treasure Valley, MA-060 Owyhee Tunnel, MA-119 Danger Point, and MA-122 Owyhee River) through the introduction of skylined transmission structures which would locally dominate scenic quality. The introduction of the B2H Project would lower scenic quality scores in these Class B Landscapes and in regard to MA-060 Owyhee Tunnel and MA-119 Danger Point, lower the scenic quality rating from Class B to Class C in the foreground distance zone.

Variation S5-A1

This variation follows the same alignment as the Applicant's Proposed Alternative Action through Link 5-15, and is located entirely within VAU MA-041 (Sourdough Basin) generating high impacts.

Variation S5-A2

This variation would have similar effects on scenic quality as Variation S5-A1.

Variation S5-B1

This variation follows the same alignment as the Applicant's Proposed Alternative Action through Links 5-50, 5-55, and 5-65, and crosses over the Owyhee River through valleys and prominent, smooth to rough foothills with steeply sloping, contrasting rock outcrops. High impacts would occur on 3 Class B VAUs (MA-039 Treasure Valley, MA-060 Owyhee Tunnel, and MA-122 Owyhee River) through the introduction of skylined transmission structures which would locally dominate scenic quality. The introduction of the B2H Project would lower scenic quality scores in these Class B Landscapes and in regard to MA-060 Owyhee Tunnel, lower the scenic quality rating from Class B to Class C in the foreground distance zone.

Variation S5-B2

This variation would have similar effects on scenic quality as Variation S5-B1 except moderate impacts on VAU MA-122 (Owyhee River) as the B2H Project would be located further to the east in agricultural lands. For visual simulation of alternative, refer to Appendix H3.

Effects on Views

Approximately 8.7 miles of high impacts and 10.8 miles of moderate impacts on views associated with residences, recreation, and travel routes would be associated with the Applicant's Proposed Action Alternative.

Effects on Residential Views

The only impacts on residential viewers would occur in one location where a residence is located 0.5 mile from the route alignment. This residence would experience partially skylined, partially backdropped views of the B2H Project crossing the Owyhee River.

Variation S5-A1

This variation shares the same alignment as the Applicant's Proposed Action Alternative. There would be no residences located in proximity to the B2H Project in this area.

Variation S5-A2

Located south of Variation S5-A1, this variation also would not have any impacts due to the distance from any residential views.

Variation S5-B1

This variation shares the same alignment as the Applicant's Proposed Action Alternative east of the Owyhee River and would have similar impacts on views associated with residential views.

Variation S5-B2

Found northeast of Variation S5-B1, this variation would affect more views associated with residences within 0.5 mile of the B2H Project than Variation S5-B1. While these residences are found on the agricultural land found on the valley floor, they would have views of the B2H Project route traversing the steep slopes, creating partially to fully skylined views of the route.

Effects on Recreational Views

There would be impacts on views from several stationary Sensitive Viewing Platforms associated with recreation. Sensitive Viewing Platform 8-33 (Double Mountain-Twin Spring Rd North) would experience a wide panoramic view of the partially skylined B2H Project generating a high residual impact level. Views from Sensitive Viewing Platform 8-52 (Lower Owyhee Interpretive Site) would be highly affected by the B2H Project due to inferior point of view of the skylined transmission line structures. Sensitive Viewing Platform 13-1 (Owyhee WSR) would experience high impacts with unobstructed views of the B2H Project from less than 0.5 mile away. This Sensitive Viewing Platform would have superior to inferior views of skylined to partially backdropped transmission line structures as the B2H Project crosses the Owyhee River and the adjacent steep canyon walls.

The Owyhee Below the Dam ACEC would have views of the Applicant's Proposed Action Alternative. Recreational viewers associated with this ACEC would be highly affected by the B2H Project similar to those described for Sensitive Viewing Platforms 8-52 and 13-1.

Variation S5-A1

This variation shares the same alignment as the Applicant's Proposed Action Alternative, adjacent to Sensitive Viewing Platform 8-33 (Double Mountain-Twin Spring Rd North), resulting in high impact on these views

Variation S5-A2

Found south of Variation S5-A1, this variation would highly affect views from Sensitive Viewing Platform 8-90 (Double Mountain Wilderness Characteristic Inventory Unit – Negro Rock Creek North) due to unobstructed views of the B2H Project in an area with limited existing modifications. Similar high impacts on Sensitive Viewing Platform 8-33 (Double Mountain-Twin Spring Rd North) would occur along this route variation.

Variation S5-B1

This variation shares the same alignment as the Applicant's Proposed Action Alternative across the Owyhee River resulting in the same high impacts on views from Sensitive Viewing Platform 8-52 (Lower Owyhee Interpretive Site), Sensitive Viewing Platform 13-1 Owyhee (WSR) and the Owyhee Below the Dam ACEC.

Variation S5-B2

Since this variation is located further to the northeast, with topographic screening opportunities from the steep canyon walls, it would have reduced impacts on views from Sensitive Viewing Platform 8-52 (Lower Owyhee Interpretive Site), Sensitive Viewing Platform 13-1 Owyhee (WSR), and the Owyhee Below the Dam ACEC.

Effects on Views from Travel Routes

High impacts would occur on the following travel routes: U.S. Highway 20, Mitchell Butte Road, and Owyhee River Canyon Road. This alternative crosses the mentioned travel routes, and result in continuous head-on views of the B2H Project until viewers would cross directly underneath the project components.

Views from U.S. Highway 20 would be highly affected in low rolling hills with low growing vegetation. Views of the B2H Project would be mostly unobstructed yet viewers of the travel route also would experience existing transmission lines paralleling the highway. Mitchell Butte Road would have its views highly affected by the B2H Project due to skylined transmission line structures through rolling hills with low growing vegetation. Views from the Owyhee River Canyon Road would be highly affected due to views of skylined transmission line structures and turning structures crossing the river valley with steep, undulating sidewalls and jagged rock outcroppings/cliffs over the Owyhee River.

Variations S5-A1 and S5-A2

These variations would not have any impacts on views associated with travel routes due to the distance away from the nearest travel route.

Variation S5-B1

This variation follows the alignment of the Applicant's Proposed Action Alternative and would have similar impacts on views associated with the Owyhee River Canyon Road travel route.

Variation S5-B2

This variation would have a lower duration of high impacts on views associated with the Owyhee River Canyon Road travel route due to the landscape being crossed by the B2H Project is less steeply sloping than the landscape crossed by Variation S5-B1.

Conformance with Management Objectives

This route does not cross USFS land; however, it does cross BLM VRM Class II and Class III lands. The B2H Project would not be in conformance with the BLM VRM Class Objectives adjacent to Sensitive Viewing Platforms 8-52 (Lower Owyhee Interpretive Site) and 13-1 (Owyhee Wild and Scenic River). Specifically, 1.8 miles of the B2H Project would be visible crossing BLM VRM Class II and Class III lands. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Variations S5-A1 and S5-A2

These variations would be in conformance with objectives associated with BLM VRM Class IV where crossed

Variation S5-B1

As this variation shares the same alignment as the Applicant's Proposed Action Alternative, the B2H Project would not be in conformance with BLM VRM Class II and III objectives as viewed from Sensitive Viewing Platforms 8-52 (Lower Owyhee Interpretive Site) and 13-1 (Owyhee Wild and Scenic River) for 1.8 miles. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Variation S5-B2

This variation would not be in conformance with BLM VRM Class II Objectives as viewed from Sensitive Viewing Platform 13-1 (Owyhee Wild and Scenic River) for 0.1 mile. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Malheur S Alternative

Effects on Landscape Character and Scenic Quality

This route shares an alignment through Link 5-5 just prior to crossing U.S. Highway 20 with the Applicant's Proposed Action Alternative extending to the southeast and would continue south after crossing U.S. Highway 20 and eventually extend to the southeast. This alternative crosses flat to rolling uplands with basalt scree patches as well as prominent smooth to rough foothills with steeply sloping, contrasting rock outcrops. It also crosses rolling, flat-topped buttes with horizontal rock bands and tops, flat to soft rolling plains, and smooth to rough mountains with jagged, and steep, rock outcrops. Of these eighteen VAUs visible within 5 miles of this alternative, two have a Class A scenic quality rating, eight have a B scenic quality rating, and the rest have a C scenic quality rating. No Class A landscapes would be highly affected by the Malheur S Alternative. Three Class B VAUs (MA-060 Owyhee Tunnel, MA-119 Danger Point, and MA-122 Owyhee River) would be highly affected as the local setting would

be dominated by the B2H Project. From areas in which the B2H Project would be visible, these VAUs also would experience decreases to their scenic quality rating scores. The decreases in scores would lower the scenic quality in VAUs MA-060 Owyhee Tunnel and MA-119 Danger Point from Class B to Class C in the foreground, and for VAU MA-078 Succor Creek (Class A), the rating would be lowered in the foreground to Class B.

Effects on Views

The Malheur S Alternative would have 0.5 mile more of high impacts and 2.6 miles more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

This route would only affect one residence along the Owyhee River that would have views of the B2H Project within 0.5 mile. The B2H Project would introduce views of skylined transmission line structures over moderately steep mountains crossing over the valley floor. The B2H Project would be partially screened by vegetation surrounding the residence.

Effects on Recreational Views

Views from Sensitive Viewing Platform 8-94 (Double Mountain Wilderness Characteristic Inventory Unit – Negro Rock Creek South) would be highly affected due to panoramic views of unobstructed partially backdropped transmission line structures from a level viewing angle of view. Views from Sensitive Viewing Platform 8-85 (Sourdough Mountain Wilderness Characteristic Area – Twin Spring Road) would be highly affected due to views of partially backdropped partially skylined transmission line structures

Viewers located in the Owyhee Below the Dam ACEC would have views highly affected, due to the B2H Project crossing the ACEC, for approximately 4.5 miles.

Effects on Views from Travel Routes

The Malheur S Alternative would result in a high degree of impact on U.S. Highway 20 and the Owyhee River Canyon Road. The alternative would directly cross these travel routes, and result in continuous head-on views of the B2H Project until viewers would cross underneath the project components. Views from Owyhee River Canyon Road would occur further upstream into the canyon in comparison with the Applicant's Proposed Action Alternative, and would be viewed in context with an existing 500-kV transmission line that crosses the canyon within approximately 1 mile of the proposed Malheur S Alternative. The Malheur S Alternative would result in low impacts on Mitchell Butte Road.

Conformance with Management Objectives

The Malheur S Alternative does not cross USFS land. This route would not be in conformance with VRM Class II objectives on views from Sensitive Viewing Platform 8-96 (Owyhee River Recreation Site) for 0.7 mile. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Malheur A Alternative

Effects on Landscape Character and Scenic Quality

Since the majority of the Malheur A Alternative follows the same alignment as the Malheur S Alternative, the impacts on Landscape Character and Scenic Quality would be similar to those generated by the Malheur S Alternative except where MA-122 Owyhee River is crossed by Link 5-35, this alternative is located in closer proximity to an existing 500-kV transmission line reducing the effects associated with the B2H Project on the landscape since the setting has already been modified by this existing line.

Effects on Views

The Malheur A Alternative would have 0.6 mile less of high impacts and 5.0 miles more of moderate impacts than the Applicant's Proposed Action Alternative on views associated with residents, recreation, and travel routes.

Effects on Residential Views

This alternative would highly affect views from a single residence along the Owyhee River, located between the B2H Project and the existing 500-kV transmission line, due to unobstructed views of skylined transmission line structures.

Effects on Recreational Views

Views from Sensitive Viewing Platform 8-4 (Buck Gulch Proposed Wilderness Study Area) would be highly affected due to panoramic views of a mostly skylined B2H Project. Views from Sensitive Viewing Platform 8-84 (Burnt Mountain Wilderness Characteristic Area – Old Mormon hand cart trail) also would be highly affected by the B2H Project due to views of multiple turning structures and skylined transmission line structures. Viewers associated with the Owyhee Below the Dam ACEC would experience similar impacts as the Malheur S Alternative.

Effects on Views from Travel Routes

The Malheur A Alternative would result in a high degree of impact on U.S. Highway 20 and the Owyhee River Canyon Road. The alternative would directly cross these travel routes, and result in continuous head-on views of the B2H Project until viewers would cross underneath the project components. Views from Owyhee River Canyon Road would occur further upstream into the canyon in comparison with the Applicant's Proposed Action Alternative, and would be viewed in close context with an existing 500-kV transmission line that crosses the canyon within approximately 0.3 mile of the proposed Malheur A Alternative. The Malheur A Alternative would result in low impacts on Mitchell Butte Road.

Conformance with Management Objectives

The Malheur A Alternative would not be in conformance with VRM Class II objectives as viewed from Sensitive Viewing Platforms 8-96 (Owyhee River Recreation Site) and 8-95 (Owyhee Canyon Recreation Site) for a total of 1.7 miles. Areas of non-conformance with BLM VRM Class Objectives, resulting in a project-specific RMP amendment, are discussed in Section 3.4.

Conclusions

Impacts associated with the alternatives and variations within Segment 5 vary based on the types of effects being considered (e.g. landscape character and scenic quality, types of viewers, and conformance with management objectives). The Applicant's Proposed Action Alternative would result in a high level of impacts on landscape character and scenic quality because it traverses landscapes that are mostly undeveloped. Although both the Malheur A and Malheur S alternatives also cross primarily undeveloped lands, these alternatives are partially colocated with existing 500-kV transmission line and thus would have fewer impacts. The Malheur A Alternative parallels the existing transmission line for a greater distance than the Malheur S Alternative.

The Malheur A Alternative would have the lowest impacts on both residential viewers and viewers using travel routes. However, the Applicant's Proposed Action Alternative would have lower impacts on recreational viewers since it would be adjacent to and visible from less recreational viewing platforms. Variation S5-B2 would have even fewer effects on viewers than the Applicant's Proposed Action Alternative.

All three of the alternatives within Segment 5 would result in non-conformance with BLM objectives. The Malheur S Alternative would result in the least amount of non-conformance, and unlike the other two alternatives, would have non-conformance issues from only one KOP. The preferred route from the perspective of conformance with management objectives would therefore be the Malheur S Alternative, and the S5-B2 variation of this alternative would further reduce the amount of non-conformance.

SEGMENT 6—TREASURE VALLEY

The following narrative discussions describe the impacts associated with each alternative in Segment 6. Additional details regarding these analyses can be found in Table 3-433, Table 3-434, and Table 3-435. Table 3-434 presents the scenic quality impacts by VAU for each alternative route and route variation within Segment 6. This table includes the acreage within the foreground and middleground of each VAU that would have views of each alternative alignment. The existing scenic quality rating of each VAU also is included in this table, along with the residual scenic quality rating and score for both the foreground and middleground acreage. These residual scenic quality scores are based on the amount of change in score anticipated based on the criteria presented in Table 3-434.

Potential impacts on viewers are represented in Table 3-433 and Table 3-435. Table 3-434 presents an overall comparison of impacts on viewers, as measured in miles of high, moderate, and low impacts. The mileages of impacts are associated with the impacts as they relate back to the alignment of each alternative in Segment 6. This table also includes the total mileage of each alignment. Table 3-435 presents specific impacts anticipated from Sensitive Viewing Platforms, along with the status of conformance with BLM VRM objectives for BLM-related Sensitive Viewing Platforms within Segment 6. Each assessment of conformance also is accompanied by the length of the alternative that can be viewed crossing the associated BLM VRM Class(es).

Conformance with USFS VQOs is not presented in this segment. USFS is not affected by Segment 6—Treasure Valley.

At the end of this section is a conclusion of the impacts on Segment 6, which provides an overview of impacts as well as to which alternative routes and/or variations would be preferable. Because there are several facets to consider when analyzing potential impacts on visual resources (e.g. landscape character and scenic quality, viewers, and plan conformance), this overview provides preferences associated with each of those facets.

Table 3-433. Residual Impacts on Viewers for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Residual Impacts (miles)		
		High	Moderate	Low
Applicant's Proposed Action	28.0	2.3	11.3	14.4
Variation S6-A1	*9.3*	*1.8*	*2.0*	*5.5*
Variation S6-A2	*8.9*	*1.1*	*3.5*	*4.3*
Variation S6-B1	*14.4*	*0.5*	*7.5*	*6.4*
Variation S6-B2	*14.1*	*1.1*	*6.2*	*6.8*

Table 3-434. Scenic Quality Impacts by Visual Analysis Unit for Segment 6—Treasure Valley

Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
FR-029 Snake River/Given Hot Springs								
Applicant's Proposed Action	0	9,066	Not applicable					
Variation S6-A1	*Not applicable*							
Variation S6-A2	*Not applicable*							
Variation S6-B1	*0*	*5,811*	*Not applicable*					
Variation S6-B2	*0*	*5,566*	*Not applicable*					
FR-030 Hidden Valley								
Applicant's Proposed Action	0	11,571	Not applicable					
Variation S6-A1	*0*	*10,021*	*Not applicable*					
Variation S6-A2	*0*	*8,389*	*Not applicable*					
Variation S6-B1	*Not applicable*							
Variation S6-B2	*Not applicable*							
MA-039 Treasure Valley								
Applicant's Proposed Action	16	7,792	B (17.0)	High	Low	B (15.5)	B (17.0)	16
Variation S6-A1	*0*	*6,301*	*B (17.0)*	*No change*	*Low*	*B (17.0)*	*B (17.0)*	*0*
Variation S6-A2	*0*	*6,301*	*B (17.0)*	*No change*	*Low*	*B (17.0)*	*B (17.0)*	*0*
Variation S6-B1	*Not applicable*							

Table 3-434. Scenic Quality Impacts by Visual Analysis Unit for Segment 6—Treasure Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
Variation S6-B2	*Not applicable*							
MA-060 Owyhee Tunnel								
Applicant's Proposed Action	0	117	B (11.5)	No change	Low	B (11.5)	B (11.5)	0
Variation S6-A1	*Not applicable*							
Variation S6-A2	*Not applicable*							
Variation S6-B1	*Not applicable*							
Variation S6-B2	*Not applicable*							
MA-074 Board Coral								
Applicant's Proposed Action	0	822	C (10.5)	No change	Low	C (10.5)	C (10.5)	0
Variation S6-A1	*Not applicable*							
Variation S6-A2	*Not applicable*							
Variation S6-B1	*Not applicable*							
Variation S6-B2	*Not applicable*							
MA-075 North Alkali								
Applicant's Proposed Action	548	19,802	C (8.5)	High	Moderate	C (7.0)	C (7.5)	20,350
Variation S6-A1	*0*	*14,029*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S6-A2	*0*	*14,000*	*C (8.5)*	*No change*	*Low*	*C (8.5)*	*C (8.5)*	*0*
Variation S6-B1	*Not applicable*							
Variation S6-B2	*Not applicable*							
MA-077 Antelope Springs								
Applicant's Proposed Action	2,145	7,579	C (10.5)	High	Moderate	C (9.0)	C (9.5)	9,724
Variation S6-A1	*1,944*	*7,779*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*9,723*
Variation S6-A2	*1,628*	*7,945*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*9,573*
Variation S6-B1	*Not applicable*							
Variation S6-B2	*Not applicable*							
MA-078 Succor Creek								
Applicant's Proposed Action	191	756	A (19.0)	High	Moderate	B (17.5)	B (18.0)	947
Variation S6-A1	*0*	*947*	*A (19.0)*	*No change*	*Moderate*	*A (19.0)*	*B (18.0)*	*947*
Variation S6-A2	*0*	*947*	*A (19.0)*	*No change*	*Moderate*	*A (19.0)*	*B (18.0)*	*947*
Variation S6-B1	*Not applicable*							
Variation S6-B2	*Not applicable*							

Table 3-434. Scenic Quality Impacts by Visual Analysis Unit for Segment 6—Treasure Valley								
Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
OW-001 Owyhee Mountains								
Applicant's Proposed Action	7,516	19,807	C (10.5)	High	Moderate	C (9.0)	C (9.5)	27,323
Variation S6-A1	*4,375*	*19,373*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*23,748*
Variation S6-A2	*4,213*	*19,534*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*23,747*
Variation S6-B1	*3,583*	*21,411*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*24,994*
Variation S6-B2	*3,519*	*21,472*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*24,991*
OW-005 Squaw Creek								
Applicant's Proposed Action	373	1,515	C (10.5)	High	Moderate	C (9.0)	C (9.5)	1,888
Variation S6-A1	*Not applicable*							
Variation S6-A2	*Not applicable*							
Variation S6-B1	*373*	*1,515*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*1,888*
Variation S6-B2	*447*	*1,441*	*C (10.5)*	*High*	*Moderate*	*C (9.0)*	*C (9.5)*	*1,888*
OW-006 Willow Spring								
Applicant's Proposed Action	6,566	24,330	C (6.0)	High	Moderate	C (4.5)	C (5.0)	30,896
Variation S6-A1	*Not applicable*							
Variation S6-A2	*Not applicable*							
Variation S6-B1	*5,337*	*22,769*	*C (6.0)*	*High*	*Moderate*	*C (4.5)*	*C (5.0)*	*28,106*
Variation S6-B2	*5,180*	*22,926*	*C (6.0)*	*High*	*Moderate*	*C (4.5)*	*C (5.0)*	*28,106*
OW-007 Salmon Butte								
Applicant's Proposed Action	<1	3,398	A (19.5)	Low	Low	A (19.5)	A (19.5)	0
Variation S6-A1	*Not applicable*							
Variation S6-A2	*Not applicable*							
Variation S6-B1	*<1*	*3,398*	*A (19.5)*	*Low*	*Low*	*A (19.5)*	*A (19.5)*	*0*
Variation S6-B2	*74*	*3,460*	*A (19.5)*	*Moderate*	*Low*	*A (19.5)*	*A (19.5)*	*0*
OW-008 Reynolds Creek								
Applicant's Proposed Action	0	1,241	B (13.5)	No change	Low	B (13.5)	B (13.5)	0
Variation S6-A1	*Not applicable*							
Variation S6-A2	*Not applicable*							
Variation S6-B1	*0*	*1,187*	*B (13.5)*	*No change*	*Low*	*B (13.5)*	*B (13.5)*	*0*
Variation S6-B2	*0*	*1,187*	*B (13.5)*	*No change*	*Low*	*B (13.5)*	*B (13.5)*	*0*

Table 3-434. Scenic Quality Impacts by Visual Analysis Unit for Segment 6—Treasure Valley

Alternative Route	Acres Visible		Existing Scenic Quality Class (Rating)	Residual Impact Level		Residual Scenic Quality Class (Rating)		Total Change in Scenic Quality Rating (in acres)
	Foreground	Middleground		Foreground	Middleground	Foreground	Middleground	
OW-019 Treasure Valley								
Applicant's Proposed Action	814	46,159	B (13.5)	High	Moderate	B (12.0)	B (12.5)	46,973
Variation S5-A1	*61*	*29,562*	*B (13.5)*	*High*	*Moderate*	*B (12.0)*	*B (12.5)*	*29,623*
Variation S5-A2	*337*	*30,493*	*B (13.5)*	*Moderate*	*Low*	*B (12.5)*	*B (13.5)*	*337*
Variation S5-B1	*282*	*32,152*	*B (13.5)*	*High*	*Moderate*	*B (12.0)*	*B (12.5)*	*32,434*
Variation S5-B2	*90*	*30,971*	*B (13.5)*	*Moderate*	*Low*	*B (12.5)*	*B (13.5)*	*90*
OW-020 Jump Creek								
Applicant's Proposed Action	23	4886	A (18.5)	Moderate	Low	B (17.5)	A (18.5)	23
Variation S6-A1	*0*	*511*	*A (18.5)*	*No change*	*Low*	*A (18.5)*	*A (18.5)*	*0*
Variation S6-A2	*0*	*511*	*A (18.5)*	*No change*	*Low*	*A (18.5)*	*A (18.5)*	*0*
Variation S6-B1	*23*	*488*	*A (18.5)*	*Moderate*	*Low*	*B (17.5)*	*A (18.5)*	*23*
Variation S6-B2	*142*	*369*	*A (18.5)*	*Moderate*	*Low*	*B (17.5)*	*A (18.5)*	*142*

Table 3-435. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 6—Treasure Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
Stationary Sensitive Viewing Platforms				
8-75 Antelope Creek Wilderness Characteristic Area				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S6-A1	*Low*	*IV*	*Yes*	*0.0*
10-12 Snake River Access - Map Rock Road				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S6-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*
10-17 Snake River Overlook – Pump Road				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S6-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*

Table 3-435. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 6—Treasure Valley

Alternative Route	Residual Impact Level	Visual Resource Management Classes Crossed and Visible	Conformance with Visual Resource Management Objectives (Yes/No)	Visible Miles not in Conformance with Resource Management Objectives
10-19 Map Rock Campground				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S6-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*
12-4 Givens Hot Springs Campground				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S6-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*
12-5 Hemingway Butte Trailhead Off-Highway Vehicle Recreation Site				
Applicant's Proposed Action	Low	IV	Yes	0.0
12-8 Jump Creek Canyon Area of Critical Environmental Concern				
Applicant's Proposed Action	Moderate	III	Yes	0.0
	Moderate	IV	Yes	0.0
Variation S6-A1	*Moderate*	*III*	*Yes*	*0.0*
Variation S6-A2	*Moderate*	*III*	*Yes*	*0.0*
	Moderate	*IV*	*Yes*	*0.0*
Variation S6-B1	*Moderate*	*III*	*Yes*	*0.0*
	Moderate	*IV*	*Yes*	*0.0*
Variation S6-B2	*Moderate*	*III*	*Yes*	*0.0*
12-13 Residential Area South of Wilson - China Ditch Road				
Applicant's Proposed Action	Low	IV	Yes	0.0
Variation S6-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*
12-17 Squaw Creek Canyon				
Applicant's Proposed Action	Moderate	III	Yes	0.0
	Moderate	IV	Yes	0.0
Variation S6-B1	*Moderate*	*III*	*Yes*	*0.0*
	Moderate	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*
12-18 Squaw Creek Research Natural Area – North				
Applicant's Proposed Action	Low	III	Yes	0.0
	Low	IV	Yes	0.0
Variation S6-B1	*Low*	*III*	*Yes*	*0.0*
	Low	*IV*	*Yes*	*0.0*
Variation S6-B2	*Moderate*	*III*	*Yes*	*0.0*

Table 3-435. Impacts on Sensitive Viewing Platforms and Conformance with Bureau of Land Management Visual Resource Management Objectives for Segment 6—Treasure Valley				
Alternative Route	**Residual Impact Level**	**Visual Resource Management Classes Crossed and Visible**	**Conformance with Visual Resource Management Objectives (Yes/No)**	**Visible Miles not in Conformance with Resource Management Objectives**
12-21 Wilson Creek Trailhead				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S6-B1	*Moderate*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Moderate*	*IV*	*Yes*	*0.0*
12-22 Wilson Creek Wayside				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S6-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*
12-23 Southern Terminus – Wilson Creek Road				
Applicant's Proposed Action	Moderate	IV	Yes	0.0
Variation S6-B1	*Low*	*IV*	*Yes*	*0.0*
Variation S6-B2	*Low*	*IV*	*Yes*	*0.0*
12-27 Residence on Poison Creek Road				
Applicant's Proposed Action	Low	III	Yes	0.0
	Low	IV	Yes	0.0
Variation S6-A1	*Low*	*III*	*Yes*	*0.0*
	Low	*IV*	*Yes*	*0.0*
Variation S6-A2	*Low*	*III*	*Yes*	*0.0*
	Low	*IV*	*Yes*	*0.0*
Variation S6-B1	*Low*	*III*	*Yes*	*0.0*
	Low	*IV*	*Yes*	*0.0*
Variation S6-B2	*Moderate*	*III*	*Yes*	*0.0*
12-28 Residence on Jump Creek Road				
Applicant's Proposed Action	Moderate	III	Yes	0.0
	Moderate	IV	Yes	0.0
Variation S6-A1	*Moderate*	*III*	*Yes*	*0.0*
	Moderate	*IV*	*Yes*	*0.0*
Variation S6-A2	*Moderate*	*III*	*Yes*	*0.0*
	Moderate	*IV*	*Yes*	*0.0*
Variation S6-B1	*Moderate*	*III*	*Yes*	*0.0*
	Moderate	*IV*	*Yes*	*0.0*
Variation S6-B2	*Moderate*	*III*	*Yes*	*0.0*

Applicant's Proposed Action Alternative

Effects on Landscape Character and Scenic Quality

Extending generally to the southwest, this alternative crosses rolling mountains with rough rock outcroppings to irregular foothills with adjacent areas, including flatter agricultural lands in Treasure Valley. Of the thirteen VAUs with visible within 5 miles of this alternative (Table 3-434), four have a

Class A scenic quality rating, four have a B scenic quality rating, and the rest have a C scenic quality rating. A Class A VAU, MA-078 Succor Creek, would be highly affected and OW-020 Jump Creek, also a Class A landscape, would be moderately affected by the B2H Project. Additionally, two of the four Class B VAUs (MA-039 Treasure Valley and OW-019 Treasure Valley) would experience high residual impacts due to partial skylining of the proposed transmission line structures. From areas in which the B2H Project would be visible, these VAUs also would experience decreases to the scenic quality rating scores. The decreases in scores would lower the scenic quality rating of VAUs MA-078 Succor Creek and OW-020 Jump Creek from Class A to Class B.

Variation S6-A1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative from Link 6-10 to 6-20, through rolling mountains with rough rock outcroppings to irregular foothills that are generally associated with a Class C scenic quality. This variation would lower the existing scenic quality scores in adjacent Class B VAUs, due to high impacts on a Class B VAU (OW-019 Treasure Valley) and moderate impacts on VAU MA-078 Succor Creek, resulting in a decrease in the scenic quality rating from Class A to Class B within the middleground.

Variation S6-A2

This route variation parallels the Applicant's Proposed Action Alternative from Link 6-5 to 6-15, through rolling mountains with rough rock outcroppings to irregular foothills that are generally associated with a Class C scenic quality. This variation would lower the existing scenic quality scores in adjacent Class B VAUs, including moderate impacts on a Class B VAU (OW-019 Treasure Valley) in addition to moderately affecting and reducing the scenic quality rating in MA-078 Succor Creek from Class A to Class B within the middleground.

Variation S6-B1

This route variation follows the same alignment as the Applicant's Proposed Action Alternative through Link 6-25, through rolling mountains with rough rock outcroppings to irregular foothills that are generally associated with a Class C scenic quality. This variation would lower the existing scenic quality scores in adjacent Class B VAUs, including high impacts on a Class B VAU (OW-019 Treasure Valley). Additionally, the B2H Project would moderately affect the Class A VAU OW-020 Jump Creek, since the B2H Project located closer to the VAU than the existing 500-kV transmission line, and lower its rating to Class B within the foreground distance zone.

Variation S6-B2

This route variation would parallel the Applicant's Proposed Action Alternative, through rolling mountains with rough rock outcroppings to irregular foothills that are generally associated with a Class C scenic quality. Two Class A VAUs would be moderately affected by the B2H Project (OW-007 Salmon Butte and OW-020 Jump Creek) in addition to moderate impacts on a Class B VAU (OW-019 Treasure Valley). This alternative would lower the existing scenic quality scores in adjacent Class A and B VAUs, including reducing OW-020 Jump Creek from Class A to Class B within the foreground distance zone.

Effects on Views

Approximately 2.3 miles of high impacts and 11.3 miles of moderate impacts on views associated with residents, recreation, and travel routes would be associated with the Applicant's Proposed Action Alternative.

Effects on Residential Views

Moderate impact on residential viewers would occur on unobstructed panoramic views of the B2H Project from residential Sensitive Viewing Platform 12-28 (Residences on Jump Creek Road) and residences on Poison Creek Road, located approximately 0.2 mile away from the route, in context with the existing 500-kV transmission line located 0.5 mile away.

Variation S6-A1

Similar to the Applicant's Proposed Action Alternative, moderate impacts would occur on views from residences within 0.5 mile of the B2H Project on Poison Creek Road.

Variation S6-A2

Similar to the Applicant's Proposed Action Alternative, moderate impacts would occur on views from residences within 0.5 mile of the B2H Project on Poison Creek Road.

Variation S6-B1

Similar to Applicant's Proposed Action Alternative, moderate impacts would occur on views from residential Sensitive Viewing Platform 12-28 (Residences on Jump Creek Road) as the existing transmission line would be viewed in context with the B2H Project.

Variation S6-B2

Similar to Applicant's Proposed Action Alternative, moderate impacts would occur on views from residential Sensitive Viewing Platform 12-28 (Residences on Jump Creek Road).

Effects on Recreational Views

Views from Sensitive Viewing Platform 12-17 (Squaw Creek Canyon) would be moderately affected by the B2H Project as views include an existing 500-kV transmission line, which would be codominant in the viewshed, and views of the B2H Project would be mostly backdropped and partially screened by topography. Moderate impacts on views from Sensitive Viewing Platform 12-23 (Southern Terminus – Wilson Creek Road) would occur from less than 0.5 mile away since an existing 230-kV transmission line is located closer to the Sensitive Viewing Platform and the Hemingway Substation and associated 500-kV transmission lines also are visible in the viewshed. The views from Sensitive Viewing Platforms 12-21 (Wilson Creek Trailhead) and 12-22 (Wilson Creek Wayside) also would be moderately affected by the B2H Project as viewed in context with the existing 500-kV transmission line.

Variations S6-A1 and S6-A2

Impacts on recreation Sensitive Viewing Platforms on this route variation would be low in magnitude.

Variation S6-B1

As this route follows the same alignment as the Applicant's Proposed Action Alternative, it would have the same impacts on Sensitive Viewing Platform 12-17 (Squaw Creek Canyon) and Sensitive Viewing Platform 12-21 (Wilson Creek Trailhead)

Variation S6-B2

Impacts on Sensitive Viewing Platform 12-21 (Wilson Creek Trailhead) would be similar to the Applicant's Proposed Action Alternative.

Effects on Linear Viewing Platforms

No linear viewing platforms were identified in Segment 6.

Conformance with Management Objectives

No USFS-administered lands are adjacent to Segment 6. The B2H Project would meet the objectives associated with BLM VRM Class III and IV lands crossed.

Variations S6-A1, S6-A2, S6-B1, and S6-B2

The B2H Project would meet the objectives associated with BLM VRM Class III and IV lands crossed.

Conclusions

Segment 6 analyzed only one alternative route, the Applicant's Proposed Action Alternative, with two variations (Variations S6-A2 and S6-B2). Impacts associated with the Applicant's Proposed Action Alternative and variations in Segment 6 vary based on the types of effects being considered (e.g. landscape character and scenic quality, types of viewers, and conformance with management objectives). Variation S6-A2 is colocated more closely with an existing 500-kV transmission line and thus, would result in fewer impacts than Variation S6-A1 in the northern portion of Segment 6. In the southern portion of the segment, Variation S6-B1 is colocated more closely with an existing 500-kV transmission line and thus, would result in less impact than Variation S6-B2..

Because all of routes considered in Segment 6 are colocated to some extent with the existing 500-kV transmission line, there would be no significant difference in impacts on views associated with the variations in Segment 6.

The Applicant's Proposed Action Alternative and the variations in Segment 6 would conform with visual management objectives.

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3.2.13 CULTURAL RESOURCES

3.2.13.1 INTRODUCTION

This section of the Final EIS discusses the presence of cultural resources in the B2H Project area and the impacts that the B2H Project would have on those resources. This section also presents potential measures to be implemented to avoid, minimize, or mitigate any identified effects on cultural resources. The cultural data, methods, and analyses used in the Final EIS are based on information provided in the 2014 Draft EIS for the B2H Project (BLM 2014), as well as new information relevant to additional alternative routes and route variations, along with environmental concerns that have become available since the publication of the Draft EIS, including comments provided during scoping.

Cultural resources, as broadly defined in the BLM Manual 8100 (BLM 2004a), are locations of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term "cultural resources" includes archaeological, historical, and architectural sites, structures, and places and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. Cultural resources are recognized as fragile and irreplaceable material, places, and things with potential public and scientific uses. Richard C. Hanes (1995:1) also offers a broader definition of cultural resources as including "native species (plants and animals), inanimate materials, landforms, archaeological sites, ancestral grounds, and other components of the physical environment…"

Although these broad definitions are generally accepted, what constitutes a "cultural resource" to specific agencies and Native American sovereign tribal governments may differ. For instance, some Native American tribes prefer that the term encompasses both the visual and spiritual elements of cultural practices, which may include cultural landscapes that possess natural resources and landforms that are important to the tribes.

Under this broader term of "cultural resources," there are also other more specific terms, including "historic property of religious and cultural significance to an Indian tribe" and "TCPs." Although these two terms commonly are used interchangeably, there are subtle differences between them, and it is important to understand these differences in order to more fully understand the cultural analysis.

The term "TCP" was coined by Patricia L. Parker and Thomas King (1998) to mean a place that might be eligible for the NRHP because of "its association with cultural practices or beliefs of a living community that (a) are rooted in the community's history and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1998:1). The term "TCP" can be used to ascribe significance by any ethnic group or organization, and it must meet the requirements defined in 36 CFR 60.4 and the NPS National Register Bulletin No. 38. TCPs are defined only in NPS guidance and are not referenced in any statute or regulation. To identify TCPs, the BLM relies on the NPS National Register Bulletin No. 38 and other NPS guidance, and consultation with Indian tribes, ethnic groups or communities ascribing traditional significance to an area. The term "historic property of religious and cultural significance to an Indian tribe," however, is used in federal law and regulations

specifically to describe a property to which a Native American tribe, or tribes, ascribes cultural and spiritual significance (ACHP 2012). Furthermore, Section 101(d)(6)(A) of the NHPA clarified that a historic property of religious and cultural significance to an Indian tribe may be eligible for listing in the NRHP. Unlike TCPs, the determinations of NRHP eligibility of such properties are not tied to continual or physical use of the property (ACHP 2012). Legislation applicable to cultural resources are presented below (Section 3.2.13.2).

These two terms, as they are used in this EIS, will be used according to the aforementioned definitions. For information regarding resources of Native American concern, refer to Section 3.2.14.

For the B2H Project, the BLM is considering TCPs from other ethnic groups (non-tribal) and organizations, but no resources have been identified during consultation. In addition, to identify historic properties of religious and cultural significance to Indian tribes, the BLM relies on government-to-government consultation and ethnographic studies. Both contemporary and ethnographic tribal input regarding the spiritual and traditional importance of these sites to the tribes is a key element in understanding and addressing tribal concerns.

3.2.13.2 Regulatory Framework

Federal Legislation Applicable to Cultural Resources

Federal agencies must consider the effects of their actions on cultural resources under NEPA and Section 106 (54 U.S.C. 306108) of the NHPA (54 U.S.C. 300101 et seq.). Specifically, Section 106 of the NHPA directs federal agencies to take into account the effects of their actions on historic properties and to provide the ACHP a reasonable opportunity to comment. The Section 106 process is separate from, but often conducted parallel with, the preparation of an EIS.

Other federal legislation applicable to cultural resources in the B2H Project area includes:

- **American Antiquities Act of 1906** (54 U.S.C. 320301 et seq.) provides guidance for protecting cultural resources on federal lands and authorizes the President to designate national monuments on federal lands.
- **Archaeological and Historic Preservation Act of 1974** (AHPA) (54 U.S.C. 302101) requires federal agencies to provide for the preservation of historical and archaeological data which might otherwise be lost or destroyed as the result of any federally licensed activity or program causing an alteration of terrain.
- **Archaeological Resources Protection Act of 1979** (ARPA) (54 U.S.C. 302101), amended in 1988, authorizes federal land-managing agencies to manage through a permit process the excavation or removal, or both, of archaeological resources on federal lands. These agencies must consult with Native American sovereign tribal governments with interests in resources prior to issuance of permits. In addition, the law sets penalties for the damage, defacement, unpermitted excavation, or removal of archaeological resources on federal lands.
- **Historic Sites Act of 1935** (54 U.S.C. 320101 et seq.) declares that it is a national policy to preserve historic sites, buildings, and objects of national significance for the public use, as well as

the inspiration and benefit, of the people of the U.S. This act led to the eventual establishment in the NPS of the Historic Sites Survey, the Historic American Building Survey, the Historic American Engineering Record, and the National Historic Landmarks Program.

- **Native American Graves Protection and Repatriation Act of 1990** (NAGRPA) (25 U.S.C. 3001 to 3002) provides a process through which federal agencies consult with affected Native Americans regarding the treatment and return of human remains, funerary objects, sacred objects, and items of cultural patrimony identified on federal lands.
- **National Trails System Act of 1968** (NTSA) (16 U.S.C. 1241 to 1249), amended in 2009, instructs federal agencies, such as the BLM and the NPS, to develop management plans to identify and protect designated National Trails, including NHTs, and their associated sites and resources (BLM 1986, 2012a; NPS 1998). It is the responsibility of the BLM to protect and interpret trail resources that are under its jurisdiction (BLM 1986, 2012a).
- **Religious Freedom Restoration Act of 1993** (RFRA) (42 U.S.C. 2000bb to 2000bb-4), amended in 2003, prohibits federal agencies from substantially burdening any person's exercise of religion, even if the burden results from a rule of general applicability, except if the federal agencies demonstrate that application of the burden to the person is in furtherance of a compelling governmental interest and is the least restrictive means of furthering that compelling governmental interest.
- **Executive Order 11593, Protection and Enhancement of the Cultural Environment**, issued in 1971, directs federal land-managing agencies to (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations; (2) initiate measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people; and (3) in consultation with the ACHP (54 U.S.C. 304102), institute procedures to ensure that federal plans and programs contribute to the preservation and enhancement of nonfederally owned sites, structures, and objects of historical, architectural, or archaeological significance.
- **Executive Order 13007, Indian Sacred Sites**, issued in 1996, directs federal land-managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.
- **Executive Order 13287, Preserve America**, issued in 2003, provides leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the federal government and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties.
- **Secretarial Order 3330, Improving Mitigation Policies and Practices of the Department of the Interior** establishes a department-wide mitigation strategy that will ensure consistency and efficiency in the review and permitting of infrastructure development projects and in conserving the nation's valuable natural and cultural resources.

For specific federal legislation applicable to tribal consultation in the B2H Project area, refer to Section 3.2.14.

STATE LEGISLATION APPLICABLE TO CULTURAL RESOURCES

Oregon statutes and guidelines applicable to cultural resources in the B2H Project area include the following:

- **ORS 358.905 to 358.955**, Archaeological Objects and Site Protections
- **ORS 390.235**, Permits and Conditions for Excavation or Removal of Archaeological or Historic Material; Rules; Criminal Penalty and its associated Oregon Administrative Rules (736-051-0080 to 736-051-0090)
- **ORS 660-015-0000(5)**, Statewide Planning Goals and Guidelines Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces. Mandates local governments adopt programs to protect natural resources and conserve scenic, historic, and open space resources
- **ORS Chapter 97.740 to 97.760**, Indian Graves and Protected Objects.

Oregon EFSC certificate requirements:

- **OAR 345-021-0010(1) (s),** information concerning the location of archaeological sites or objects may be exempt from public disclosure under ORS 192.502(4) or ORS 192.501(11)
- **OAR 345-022-0090**, protects the public interest in preserving places that have historic, cultural, or archaeological significance, including sites of historic or religious importance to Native American tribal governments. The standard preserves historic and cultural artifacts and prevents permanent loss of the archaeological record unique to particular sites in the state.

Idaho statutes and guidelines applicable to cultural resources in the B2H Project area include the following:

- **Idaho Code Title 27, Chapter 5, Sections 27-502 to 27-504**, Protection of Graves.
- **Idaho Code Title 33, Chapter 39**, establishes the Idaho Archaeological Survey and emphasizes that sites, monuments, and points of interest connected with the history and development of the state merit preservation and protection.
- **Idaho Code Title 67, Chapter 41**, establishes the Idaho Historical Society to encourage the preservation of cultural and historic resources.
- **Idaho Code Sections 9-337 to 9-350**, the Idaho Public Records Law, which stipulates the following records as exempt from disclosure: (1) records, maps, or other records identifying the location of archaeological or geophysical sites or endangered species, if not already known to the general public; (2) archaeological and geologic records concerning exploratory drilling, logging, mining and other excavation, when such records are required to be filed by statute for the time provided by statute.

For specific state statutes or guidelines applicable to tribal consultation in the B2H Project area, refer to Section 3.2.14.

DEFINING HISTORIC PROPERTIES

Section 106 of the NHPA directs federal agencies to take into account the effects of their actions on historic properties. Historic properties are cultural resources that are either eligible for or are listed in the NRHP (36 CFR 60.4). Historic properties must demonstrate importance in American history, architecture, archaeology, engineering, or culture. Per 36 CFR 60.4, properties are considered significant in these categories if they meet one or more of the following criteria:

(A) Are associated with events that have made a significant contribution to the broad patterns of our history; or

(B) Are associated with the lives of persons significant in our past; or

(C) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(D) Have yielded, or may be likely to yield, information important in prehistory or history.

In addition to demonstrating significance, a historic property must demonstrate integrity in the seven following characteristics, which the NPS (1995) defines as follows:

- **Location**. The place where the historic property was constructed or the place where the historic event occurred.
- **Design**. The combination of elements that create the form, plan, space, structure, and style of a property.
- **Setting**. The physical environment of a historic property.
- **Materials**. The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- **Workmanship**. The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- **Feeling**. A property's expression of the aesthetic or historic sense of a particular period of time.
- **Association**. The direct link between an important historic event or person and a historic property.

Historic properties include properties that are of traditional religious and cultural importance to Native American tribes or other cultural communities or ethnic groups and that meet the criteria for listing in the NRHP. For the B2H Project, as well as other actions requiring NEPA analysis, the BLM has broadened its consideration of impacts to encompass all cultural resources, regardless of NRHP eligibility. The BLM Manual 8100.03.F (BLM 2004a) states that "[c]ultural resources need not be determined eligible for the National Register of Historic Places (as in the NHPA) to receive consideration under the National Environmental Policy Act." Nevertheless, where information on NRHP-listing or eligibility exists, it is used to assist with assessments of significance and impact.

3.2.13.3 Issues Identified for Analysis

Issues related to potentially significant effects on cultural resources raised by the public, Native American sovereign tribal governments, and agencies during the B2H Project scoping process and preparation of the EIS include impacts on cultural resources, historic trails and other linear sites, archaeological sites, historic mining-related sites, NRHP-listed properties, historic properties of religious and cultural significance to Indian tribes, TCPs, cultural landscapes, traditional foods, and plant-gathering areas. The BLM is considering TCPs from other cultural groups (non-tribal) and organizations but no resources have been identified during consultation. The following concerns were identified for analysis during the scoping process for this study:

- What would the effects be on places of cultural importance?
- What would the effects be on archaeological resources and historic properties?
- Can adverse effects on archaeological resources and historic properties be avoided?
- What would the effects be on resources of tribal significance (e.g., archaeological sites, human remains, plant-gathering locations, cultural landscapes, historic properties of religious and cultural significance to Indian tribes, and TCPs)?
- What would the effects be on specific resources (key resources) identified during the B2H Process scoping and preparation of the EIS (e.g., NRHP-listed properties, NWSTF Boardman and associated sites, historic districts, Graveyard Point, McKay Creek area, and sites/areas of tribal significance [including historic properties of religious and cultural significance to Indian tribes, human burial sites, rock features, McKay Creek area, Birch Creek, Butter Creek, Graveyard Point, and Medical Hot Springs])?
- What would the effects be on the Oregon NHT and trail-associated sites, Study Trails (trails under study for designation), and the Oregon Trail ACEC? For information regarding the Oregon Trail ACEC, refer to Sections 3.2.6 and 3.2.15.
- What would the effects be on traditional foods?

One congressionally designated NHT—the Oregon NHT—and five trails under study for designation, often referred to as Study Trails—the Meek Cutoff, Goodale's Cutoff, Olds Ferry Road, Umatilla River Route and Columbia River to The Dalles, and Upper Columbia River Route—are located in the study corridor. One congressionally designated NHT, the Lewis and Clark NHT, is located in the vicinity of the study corridor.

For information regarding Native American concerns, refer to Section 3.2.14. Brief descriptions of some of the specifically named resources follow.

Oregon National Historic Trail

The Oregon NHT (which will be referred to in Section 3.2.13.5 as the Oregon Trail) was among the most significant transportation routes in the West. It was designated as an NHT by Congress in 1978 after approval of the 1977 feasibility study. It consisted of a series of trails, cutoffs, river crossings, and landmarks that have demonstrated historical significance.

The Oregon NHT extended roughly 1,932 miles (3,109 kilometers), from Courthouse Square in Independence, Missouri, to Oregon City on the Willamette River in Oregon. The trail entered Oregon Territory when it crossed South Pass in what is now western Wyoming (Hutchinson and Jones 1993). The trail was established along a series of existing trails that crisscrossed the Northern Plains, the Rocky Mountains, and the Pacific Northwest. The Oregon NHT, as well as numerous other early immigrant trails, were originated by Native American tribes and were used for thousands of years before European Americans arrived. While fur trappers, traders, gold seekers, and missionaries used the trail in earlier decades, it was not until 1841 that the first wagon train (the Bidwell-Bartleson party) moved westward over the trail (Lissandrello 1976). With the completion of the Union Pacific Railroad in 1869, the use of the trail as an overland route to the Pacific rapidly declined, although sections of it continued to be used locally (Lissandrello 1976). Many well-traveled segments of the trail have been converted to modern highways and railroads, including several segments of the Old Oregon Trail Highway, the old U.S. Highway 30 (U.S. 30), and I-84, which all share similar alignments through Oregon and Idaho. Numerous markers have been erected at human burial sites, immigrant camps, inscription sites, and areas containing visible wagon ruts in the states crossed by the trail.

For further information regarding the Oregon NHT, refer to Sections 3.2.12 and 3.2.15.

FORCED MARCH OF 1879

During the winter of 1878 to 1879, following the end of the Bannock War, an estimated 550 Paiute, Bannock, and Shoshone people were gathered by the U.S. Calvary across southwestern Idaho and southeastern Oregon and marched to Fort Simcoe in southern Washington where they were held as prisoners of war (Ruby and Brown 1981). Consultation with Native American sovereign tribal governments indicates that tribal members were collected from Fort Harney, Fort Boise, and the Weiser area and then subjected to a forced march to Fort Simcoe in January of 1879. Although the overall route to Fort Simcoe would have trended northwesterly, the collection of tribal members occurred across the region and they were then routed to Fort Simcoe via existing trail networks. Shoshone-Paiute tribal history indicates that the Oregon NHT through the B2H Project area was a part of the route that their people traveled during the Forced March of 1879. This forced relocation is considered by tribal governments as a particularly significant event in their history, during which many men, women, and children died and their bodies were left unburied along the trail. The Forced March of 1879 is considered to be a spiritually significant event to these tribes, and potential B2H Project impacts on the route traveled during the forced march continue to be evaluated through government-to-government consultation.

POISON CREEK STAGE STATION

The Poison Creek Stage Station, constructed in 1886, was a way station on the Jordan Valley-Caldwell stage line (Hibbard 1977a). It includes a main house, a barn, two root cellars, a schoolhouse, a chicken coop, and an outhouse (Hibbard 1977a). Many of the outbuildings have been removed and the main habitation structure has been damaged significantly. The Poison Creek Stage Station was listed in the

NRHP on May 22, 1978. The station is located in Segment 6 along the Applicant's Proposed Action Alternative in Idaho.

3.2.13.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.3 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on cultural resources.

ANALYSIS AREA

The analysis area for cultural resources is a 4-mile-wide study corridor (i.e., 2 mile on each side of the alternative route centerlines). In accordance with 36 CFR 800 (implementing regulations for the NHPA), the BLM has identified an Area of Potential Effects (APE) in which direct and indirect effects on cultural resources from the Proposed Action could occur. The APE for the B2H Project is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16[b]). As agreed on by the consulting parties, the direct effects and indirect effects APEs for the B2H Project are as follows:

- The direct effects APE extends 250 feet on either side of the reference centerline.
- The indirect effects APE includes any cultural resource located more than 250 feet from the reference centerline up to the extent of the 4-mile-wide study corridor (i.e., up to 2 miles on either side of the reference centerline).
- The indirect effects APE for historic properties will include the visual, audible, and atmospheric elements that could adversely affect NRHP-listed or eligible properties. Consideration will be given to all qualifying characteristics of a historic property, including those characteristics that may have been identified after the original evaluation of the property's eligibility for the NRHP.
- The indirect effects APE for cultural resources that may be subject to visual effects generally is 5 miles on either side of the reference centerline or to the visual horizon, whichever is closer. Where the indirect APE includes historic properties of religious and cultural significance to Indian tribes, TCPs, NHTs, and other visually sensitive historic properties, additional analyses may be required and the indirect APE may need to be modified accordingly. These areas will require analysis on a case-by-case basis.

CULTURAL RESOURCES INVENTORY

Cultural resource inventories for the B2H Project have been divided into two phases. Phase I has been completed for the EIS and Phase II will be completed for the Selected Route, per Section 106 requirements and the Programmatic Agreement (Appendix I) for the B2H Project.

Phase I inventory consists of the following:

- A Class I literature search, as set forth in the BLM Manual 8110 (BLM 2004b:21A), consists of a compilation of existing information on known cultural resource sites and significant cultural resource inventories previously conducted from the files of a number of agencies and

institutions, including the SHPOs, THPO, and other appropriate land-managing agencies. In addition to this information, the NRHP also was reviewed to identify NRHP-listed historic properties in the study corridor. Class I data represent only the known and documented cultural resources in the 4-mile-wide study corridor centered on the Proposed Action and each alternative route and route variation analyzed in the Final EIS.

- A Class II inventory, according to the BLM Manual 8110 guidance, consists of "...statistically based surveys designed to characterize the probable density, diversity, and distribution of cultural properties in an area and to answer appropriate research questions. A variety of methods may be used, singly or in combination, to improve statistical reliability, including quadrants selected randomly or systematically, transects, stratified samples, and phased approaches" (BLM 2004b:21B). Class II surveys included 1-mile sample segments in the direct effects APE for the Proposed Action and alternative routes. New alternative routes and route variations carried forward for analysis in the Final EIS have not had Class II surveys, as these alternative routes and route variations were added to the B2H Project after the Class II surveys were completed.
- A reconnaissance level survey (RLS) was completed in the expanded study corridor for indirect effects (Tetra Tech 2014) as the first phase of the visual assessment of historic properties, per the Programmatic Agreement for the B2H Project. The RLS focused on above-ground resources (the built environment) located in the 10-mile-wide study corridor used for the Draft EIS that may be subject to visual effects. Due to the nature of the RLS and the lack of established individual site eligibility and formal site documentation, sites identified during the RLS are not included in the quantitative analysis conducted for the Final EIS. Cultural resources and potential effects on cultural resources identified during the RLS are discussed qualitatively in Sections 3.2.13.1 and 3.2.13.6. New alternative routes and route variations carried forward for analysis in the Final EIS have not had RLS, as these alternative routes and route variations were added to the B2H Project after the RLS was completed. However, if these new alternative routes or route variations are in proximity to a route for which RLS cultural data has already been collected, the existing cultural data were used in the discussion for those new alternative routes and route variations
- Ethnographic assessments of the general B2H Project area were initiated to identify historic properties of religious and cultural significance to Indian tribes and cultural landscapes, and to characterize tribal concerns regarding cultural resources in the study corridor.

Phase II inventory will consist of the following:

- A Class III intensive level inventory will be conducted for the route selected for construction as stipulated in the Programmatic Agreement for the B2H Project. A Class III inventory is a professionally conducted, comprehensive pedestrian survey that is intended to locate and record all cultural resources in the direct effects APE (BLM 2004b:21C). The Class III inventory will include all federal lands and accessible nonfederal lands in the 500-foot-wide study corridor for the Selected Route.

- An intensive level survey (ILS) will be conducted for above-ground resources identified in the RLS as requiring further study for assessment of indirect effects on cultural resources. An ILS, which is the final phase of the visual assessment of historic properties, per the Programmatic Agreement for the B2H Project, will be completed for the Selected Route.

The specific methods employed for collecting information on cultural resources during each of these phases are explained below.

Class I Literature Search

A Class I literature search for the B2H Project involved obtaining the following from the files of the SHPOs, the CTUIR THPO, the USFWS, and other appropriate land-managing agencies: (1) existing information on known cultural resource sites and (2) previously conducted cultural resource inventories. Using GIS, a shapefile was created consisting of the 4-mile-wide study corridor centered on the Proposed Action and each alternative route. Shapefiles were submitted to the Idaho SHPO, along with Class I literature search requests. The Idaho SHPO then generated lists of projects and sites intersecting the 4-mile-wide study corridor and provided digital data as available. Class I data also were collected manually from the Oregon SHPO (Oregon Archaeological Records Remote Access). All Class I data were entered into a database and site locations were mapped using GIS. A supplemental cultural resources Class I inventory was conducted for all alternative routes and route variations that were added for analysis in the Final EIS. The results of the supplemental inventory have been incorporated into the Final EIS.

The Class I literature search for cultural resources on CTUIR lands also consisted of a 4-mile-wide study corridor for the Applicant's Proposed Action Alternative only. An additional Class I literature search was conducted through to identify cultural resources situated in the 10-mile-wide study corridor for the Applicant's Proposed Action Alternative only. While not contained in the RLS Report (Tetra Tech 2014), it is anticipated that an ILS will be prepared for resources situated in the CTUIR (i.e., lands in the indirect effects APE). If the B2H Project moves forward, an RLS and ILS will be conducted for tribal land and the results will be reported in one document.

Class I data were collected at the following institutions and from the following databases:

- Idaho SHPO
- Archaeological Survey of Idaho Database
- Idaho Historic Sites Inventory Database
- Idaho Century Farms and Ranches Program
- OCTA: Northwest Chapter and Idaho Chapter
- Oregon SHPO
- Oregon Archaeological Records Remote Access
- Oregon Historic Sites Database
- Oregon Century Farms and Ranches Program
- OHTAC

- CTUIR THPO
- CTUIR Cultural Resources Protection Program
- BLM
- NPS
- USFS
- Navy

A portion of the visual study corridor falls in Benton County, Washington. For the Draft EIS, Class I data for this area were collected from the following institutions and from the following databases:

- Washington SHPO
- Washington Information System for Architectural and Archaeological Records Data
- Washington Fish and Wildlife Service

Additional data sources for the literature review included the National Register Information System, the USGS Mineral Resource Data System, the General Land Office (GLO) survey plats available at the BLM Internet public access site (http://www.glorecords.blm.gov/search/), historic state maps, historic and contemporary aerial photographs, and local landmarks and registers. USGS topographic maps and historic maps were consulted to identify potential historic properties in the study corridor.

Class I cultural resource inventory reports describe previously recorded resources and documented recommendations or determinations of the resources' eligibility for listing in the NRHP. These recommendations are reviewed by the federal agency, which, in consultation with the SHPO, THPO, and sovereign tribal governments, makes formal determinations of the resource's NRHP eligibility. These determinations, in turn, affect decision-making on how historic properties will be managed.

With regard to NHTs and Study Trails, additional data sources were used to inventory, and assess, these historic trails (refer to maps MV-25 and MV-26 for inventory data). Trail management data were acquired from the NPS, including (a) congressionally designated trail alignments, (b) high potential route segments, (c) high potential historic sites, (d) auto tour routes, and (e) Study Trails (alignment being studied for designation). Data also was acquired from the BLM, the NPS, and the Navy for those elements contributing to the NRHP listing of the Oregon NHT. The data include: (a) intact trail segments (known traces of the trail contributing to its eligibility [not in the SHPO database]) and (b) high potential historic sites (sites associated to the trail, or sites in proximity thereto, which have the potential to contribute to the significance of the trail).

Class II Fifteen Percent Sample Survey

Class II 15-percent sample surveys of the alternative routes were conducted in a 500-foot-wide study corridor (250 feet on either side of the reference centerline). Cultural resource inventories typically involve pedestrian field surveys that may locate cultural resource sites, structures, buildings, objects, and districts and provide additional information on the types, densities, and precise locations of cultural resources. The Class II 15-percent sample survey allows for more effective comparative analysis of the potential direct and indirect effects of the B2H Project on historic properties and it supplements

existing information gathered in the Class I literature search, as well as identifies archaeological resources in the direct effects APE for the Proposed Action and alternative route where existing Class I data were either sparse or lacking. As previously mentioned, Class II 15-percent sample surveys have not been completed for new alternative routes and route variations that were added for analysis in the Final EIS, as these routes and route variations were added to the B2H Project after the completion of the original Class II surveys.

The 15-percent sample survey was conducted using 1-mile-long by 500-foot-wide survey blocks (Anderson and Herron 2015; Anderson et al. 2015). The 1-mile length was used as an arbitrary measure, whereas the 500-foot width corresponds to the width of the direct effects APE.

Individual survey units were selected based on the following sampling strategy: first, for each proposed alternative route and segment, each 1-mile-long parcel was designated with a unique survey unit number (e.g., sampling units along a 50-mile-long segment were designated 1-50). A table of random numbers was then used to select specific units for inventory along the alternative route, and representative units were selected to account for inventory of 15-percent of the alternative route. The sample units were chosen randomly along accessible routes by a random number generator and based on milepost numbers. Because it was anticipated that access constraints would affect the ability to complete survey of units selected on private lands, and to ensure completion of a 15-percent sample survey, additional units were selected at random and were held in reserve for use in case of denied access or other access issues. Following these procedures, information was collected to allow for assessment and comparison of potential impacts on cultural resources.

For the Draft EIS, the Class II 15-percent sample survey in Oregon covered 85.0 linear miles of the 550.4 miles of the B2H Project area. These 85.0 miles included approximately 4,200 acres of both privately and federally owned lands in Morrow, Umatilla, Union, Baker, and Malheur counties. In Idaho, the survey covered approximately 5.0 linear miles of the 23.8 miles of the B2H Project area, including 303 acres of privately and federally owned land in Owyhee County.

Reconnaissance Level Survey

The study corridor for the RLS used for the Draft EIS to assess potential indirect effects, primarily visual effects, on cultural resources was defined as a 10-mile-wide study corridor or to the visual horizon, whichever was closer, for the Proposed Action and each alternative route (Tetra Tech 2014). The southern end of Benton County, Washington, near the Columbia River, also is part of the B2H Project area. This area is intersected only in the 10-mile-wide study corridor (indirect effects APE) with cultural resource sites identified through the Class I literature search that was completed for the B2H Project. Cultural resources and potential effects on cultural resources identified during the RLS are discussed qualitatively in Sections 3.2.13.1 and 3.2.13.6.

Identification of the indirect effects APE employed a GIS bare-earth viewshed analysis to determine whether a previously identified cultural resource could have a view of the study corridor and consequently be subjected to an indirect effect. This type of viewshed analysis is based on a DEM and, therefore, reflects visible areas of the landscape based on existing landforms, without consideration of

vegetation or built environment. Because availability of data regarding existing vegetation and built environment is limited, the bare-earth analysis makes the best use of available GIS DEM data and also provides a “worst case” scenario for visibility.

Once the B2H Project APEs were defined, a literature review was employed to identify significant built environment resources that could be affected visually by the B2H Project (Tetra Tech 2014). Significant built environment resources include NRHP-eligible or potentially NRHP-eligible buildings, structures, and sites; NRHP-listed properties; historic districts; and archaeological sites with significant above-ground components. Fieldwork was conducted by teams of two field crew members who drove publicly accessible rights-of-way and relocated previously recorded cultural resources in a systematic manner (Tetra Tech 2014). While verifying information on previously recorded cultural resources, field crew members also identified new cultural resources of sufficient integrity and potential significance to warrant identification at the reconnaissance level (refer to Tetra Tech 2014). Due to the scale of the B2H Project and the relatively rural setting for much of the study corridor, the identification efforts for the indirect effects APE primarily focused on previously recorded historic resources.

Cultural resources that were documented were 45 years old or older at the time of the RLS (Tetra Tech 2014). Resources that were found to be listed in the NRHP, were found to be NRHP-eligible or potentially eligible for listing in the NRHP, or that have the potential to be indirectly (visually) affected by the B2H Project were recommended to move forward for further evaluation and impact analysis through an ILS, which will occur in Phase II of the cultural resources inventory for the B2H Project.

Ethnographic Studies

The CTUIR and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have conducted ethnographic studies to identify areas of tribal interest and historic properties of religious and cultural significance to Indian tribes in the B2H Project area and to assist the BLM in meeting its obligations under NEPA, NRHP, Executive Order 13175, AIRFA, ARPA, and numerous other laws and executive orders. The Burns Paiute Tribe ethnographic study is in progress. The BLM treats all information gathered during ethnographic research as confidential and, therefore, specific locations or descriptions of resources are not disclosed in this EIS. However, data gathered during ethnographic studies are used to inform this EIS.

The method for conducting the ethnographic studies includes background research, literature review, and ethnographic interviews to determine contemporary and ongoing uses of culturally significant areas or sites. The CTUIR conducted analyses and field studies to identify traditional foods of significance to the Tribe.

Class III Intensive Level Inventory

Prior to initiation of construction, a Class III cultural resources inventory will be completed for the Selected Route in compliance with the requirements of Section 106 of the NHPA as detailed in the Programmatic Agreement for the B2H Project. All sites located in the direct effects APE would be

documented and evaluated for eligibility for the NRHP, and sites located in the indirect effects APE that meet the criteria established for potential visual sensitivity also will be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, Native American tribal governments participating in the B2H Project, and SHPOs, who would then determine whether the B2H Project has the potential to have an adverse effect (i.e., direct and permanent ground disturbance; direct and indirect long-term visual, atmospheric, and auditory intrusions; or direct and indirect permanent disturbance due to changes in public accessibility) on historic properties. Prior to construction activities in the area, any adverse effects on historic properties would need to be resolved per Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800.6. The Class III survey will occur after the selection of a route and the issuance of the RODs for the B2H Project. Adverse effects on cultural resources/historic properties under Section 106 will be handled in accordance with the Programmatic Agreement (Historic Properties Management Plan [HPMP]).

Any additional survey required to complete a 100 percent inventory of the Proposed Action, as well as any necessary subsurface inventory or evaluation efforts, will be conducted during Phase II in accordance with the Programmatic Agreement (Appendix I) for the B2H Project. The Programmatic Agreement also provides for a process of Class III intensive pedestrian inventory for any additional elements (e.g., roads or staging areas) that are added to the B2H Project after the RODs.

Intensive Level Survey

Per the Programmatic Agreement (Appendix I) for the B2H Project, an ILS, the final phase of the visual assessment of historic properties, will be conducted for built environment resources in the indirect effects APE for the Selected Route. The ILS will occur after the selection of a route and the issuance of the RODs for the B2H Project.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria were developed to evaluate the relative sensitivity of each previously recorded cultural resource along each alternative route and route variation. Based on the nature and significance of each previously recorded cultural resource, as well as the distance of each resource from the B2H Project centerline, a cultural resources “Sensitivity Index” (low, moderate, or high) has been assigned to each previously recorded cultural resource. In addition, an overall assessment of cultural resource sensitivity will be provided for each alternative route based on the nature and significance of the previously recorded cultural resources present and the calculated mileages of cultural resource sensitivity in each category (high, moderate, or low). To clarify, a sensitivity index has been assigned to those cultural resources with either definitive physical manifestations or cultural materials, or both, revealed by cultural resource pedestrian surveys (Class I and Class II data). The following section will describe the cultural model used to assess impacts on cultural resources.

Effects Analysis

The B2H Project alternative routes and route variations cross two states (Oregon and Idaho). Also, the cultural data (recorded in site records) represent a long span of time from the oldest to newest records; accuracy and precision of the cultural data provided in site records vary. For example, more recent records were prepared using high-accuracy global positioning systems. Older site location data dating back to the 1980s or earlier, however, were recorded using triangulation and map and compass plotting or reckoning to estimate site boundaries on a paper map. For the Final EIS, the BLM has revised the cultural impact-analysis method slightly to better account for this variability.

The model presented below is based on the sensitivity of site type (Table 3-436), the distance of each previously recorded site from the B2H Project centerline, and the number of previously recorded sites along each route segment. Based on these data, route segments have been assigned sensitivity in 0.10-mile segments using the highest sensitivity for each 0.10-mile segment as representative of that segment. Overall sensitivity for each alternative route then will be reported in combined miles of low, moderate, and high sensitivity. Based on the nature and significance of the cultural resources present, as well as the calculated mileages of cultural resource sensitivity, an overall assessment of cultural resource sensitivity will be assigned for each alternative route.

Variables Used in the Model

The potential sensitivity index for previously recorded cultural resources was calculated based on a series of key variables. The sensitivity index based on site type is the *Site Sensitivity*, or *Sensitivity Variable* equals the *Sensitivity based on Site Type*.

Sensitivity rating based on site type ranges from 1 (low sensitivity) to 5 (high sensitivity). Five ranked sensitivity categories were applied to the types of cultural resources identified through the Class I literature search and Class II cultural resources inventory efforts; these include low, low-moderate, moderate, moderate-high, and high sensitivity (Table 3-436). Assignment of cultural resource types to categories was based on a combination of criteria, including whether the resource has been listed in the NRHP or is part of an NHT designation and the BLM cultural resources' staff's knowledge of the prevalence of the resource. For example, resources graded as highly sensitive include NRHP-listed properties and resources, which may represent historic properties of religious and cultural significance to Indian tribes; lower-sensitivity resources include archaeological sites and small lithic scatters that previously have been determined to be not eligible for the NRHP. The *Sensitivity Variable* assumes that certain resources (1) are rarer than others, (2) have strong cultural values to Native American tribes and other ethnic groups, (3) are more difficult to avoid, or (4) are resources for which adverse effects are more difficult to mitigate.

The second variable considered for the sensitivity index for previously recorded cultural resources was the distance of each site from the B2H Project centerline, as shown in the following equation. The sensitivity index based on distance is the *Proximity*, or *Distance Variable* equals the *Impact based on Distance Zone*.

Sensitivity rating based on distance ranges from 1 (far from the B2H Project) to 4 (close to the B2H Project). The *Distance Variable* assumes that the likelihood of impacts on cultural resources generally would decrease as a function of distance of the resource from the B2H Project centerline.

- 0–250 feet = Index of 4
- 250 feet–750 feet = Index of 3
- 750 feet–1,000 feet = Index of 2
- 1,000 feet–2 miles = Index of 1

Model Calculations

The following calculation was used to generate, for each alternative route, a sensitivity index that takes into account the sensitivity of site type (Table 3-436) and the distance of each previously recorded cultural resource from the B2H Project centerline:

Distance Zone (DV) x Site Sensitivity (SV) = Sensitivity Index (SI)
DV (1–4) x SV (1–5) = SI (1–20)
SI 1–4 = Low
SI 5–8 = Moderate
SI 9–20 = High

The overall alternative route sensitivity rating equals the number of 0.1-mile segments, reported in miles, combined for each category (low, moderate, and high).

Table 3-436. Site Sensitivity Values

Sensitivity	Resource Types	Sensitivity Categories
Low	Nondiagnostic, pre-contact lithic scatters (lithic debitage with no additional artifacts present); historic artifact scatters (no features or structures)	1
Low	Not eligible pre-contact and historic sites; noncontributing parts of historic districts	1
Low	Isolated features (e.g., prospect pits, livestock enclosures, fences, hearths/fire-cracked rock, or dugouts) with no associated artifacts	1
Low-moderate	Task-specific sites exhibiting limited activity (e.g., small mining operation [unnamed adits, tunnels, or tailings]); pre-contact artifact and lithic scatters (no features and no tool variety)	2
Low-moderate	Historic quarries; pre-contact lithic procurement areas	2
Low-moderate	Historic locations lacking structures or having limited structural remnants (e.g., foundations); historic buildings/structures with no integrity (e.g., collapsed, burned, or destroyed)	2
Low-moderate	Utility lines (e.g., transmission lines, telegraph lines, telephone lines, or pipelines)	2
Low-moderate	Unnamed roads; unnamed ditches	2
Moderate	Roads; railroads; ferries; canals	3
Moderate	Trails lacking integrity of physical features; trail segments deemed noncontributing	3
Moderate	Medium-sized occupation (includes midden deposits [pre-contact])	3
Moderate	Task-specific sites exhibiting moderate activity indicating more than one activity (e.g., features, tool variety [e.g., ground stone, scrapers, or projectile points], or ceramics)	3
Moderate	Mining complex and mining operations with specific names	3

Table 3-436. Site Sensitivity Values		
Sensitivity	**Resource Types**	**Sensitivity Categories**
Moderate	Historic buildings (structures with integrity)	3
Moderate-high	Rock shelters/caves; pithouses; room blocks	4
Moderate-high	Large pre-contact occupation sites (e.g., village); large historic occupation sites (e.g., town sites)	4
Moderate-high	Cultural landscapes with integrity; named historic trails with integrity; historic parks, military facilities; campgrounds	4
Moderate-high	Task-specific sites exhibiting numerous activities and a variety of tool types and features/structures (e.g., groundstone, bifaces, projectile points, ceramics, midden deposits, or rock alignments)	4
Moderate-high	Cairns; rock alignments	4
Moderate-high	Petroglyphs/pictographs	4
High	National Register of Historic Places-listed sites/historic districts and parts of historic districts (contributing); National Historic Trails; National Historic Trails-associated sites (e.g., landmarks, markers, crossings, or stations)	5
High	Historic properties of religious and cultural significance to Indian tribes and traditional cultural properties	5
High	Paleoindian sites	5
High	Human burial sites; funerary objects; cemeteries, graves	5

It is important to note that the mileages of cultural resource sensitivity do not directly correlate with an equal number of miles of impacts on cultural resources. Sensitivity calculations are provided as a means for comparison of alternative routes and route variations using existing data for analysis. These calculations are used to identify potential initial impacts on known cultural resources related to implementation of the B2H Project without avoidance or other mitigation planning that would be addressed in the HPMP. The cultural analysis is based on previously recorded sites only and the potential exists for a great number of undocumented sites to exist along previously unsurveyed portions of the alternative routes and route variations under analysis. This method uses existing datasets to establish a site sensitivity index that can be used to project an overall route sensitivity based on existing data so there is a basis for the comparison of routes.

These sensitivity categories were assigned numeric values (weightings) from 1 to 5, which were used as multipliers, so that resources identified as more sensitive would generate higher scores than those identified as less sensitive. For multi-component archaeological sites, sensitivity values were assigned based on the highest-scoring component; for example, a site containing a lithic scatter and cairns would be coded as moderate-high sensitivity based on the presence of the cairns, which are considered a more sensitive cultural resource type.

Assessment of Initial Impacts

In this study, initial impacts on cultural resources are defined as those impacts that would occur on cultural resources without the application of mitigation measures. The sensitivity index (cultural resources sensitivity) assigned to each cultural resource was used to evaluate the extent of cultural resource intensity for each alternative route in 0.10-mile segments. The initial cultural resource

sensitivity was assigned using the criteria presented above. This information was then compiled, and the overall "alternative route sensitivity" was calculated for each alternative route.

Residual impacts are those effects resulting from the implementation of the B2H Project, including implementation of design features of the B2H Project for environmental protection (Table 2-7). The specific design features relevant to cultural resources include:

- **Design Feature 1 (Plan of Development)**. A POD would be prepared for implementation and maintenance of the B2H Project to provide direction to the Applicant's construction personnel, construction contractors and crews, CIC, environmental monitors, and agency personnel regarding specification of construction and to provide direction to the agencies and Applicant's personnel for operation and maintenance of the B2H Project. The POD would contain implementation plans and detailed mapping to facilitate execution of environmental protection, mitigation measures, and conservation measures. An HPMP will be developed for the B2H Project and will be included in the POD.
- **Design Feature 2 (Environmental Training for All Personnel)**. Prior to construction, the CIC would instruct all personnel on the protection of cultural resources, such as (a) federal and state laws regarding antiquities, including the collection and removal of antiquities; (b) the importance of cultural resources; (c) the purpose and necessity of protecting cultural resources; and (d) reporting and procedures for stop work. This design feature would minimize, reduce, or eliminate effects on cultural resources.
- **Design Feature 5 (Spatial Extent of Construction Activities)**. The spatial limits of construction activities, including vehicle movement, would be predetermined with activity restricted to and confined within those limits. This design feature would minimize effects on cultural resources by restricting disturbance to a predefined extent.
- **Design Feature 31 (Compliance with the NHPA)**. Specific measures to mitigate effects on cultural resources would be developed and implemented to mitigate identified adverse impacts to comply with Section 106 of the NHPA in accordance with the Programmatic Agreement entered into among the BLM, the USFS, the states of Idaho and Oregon, consulting parties, and Native American sovereign tribal governments. The intent is to develop site-specific measures to mitigate effects on cultural resources. These measures may include B2H Project modifications (e.g., selective placement of structures, span sites, or micro-siting) to avoid adverse impacts and cultural resources monitoring of construction activities to avoid or minimize damage to discoveries. Data recovery will be conducted if there are no ways to avoid ground-disturbing activities at a site.

Mitigation Planning

Mitigation efforts for adversely affected historic properties would be in accordance with the Programmatic Agreement negotiated for the B2H Project and would be documented in the HPMP. Any adverse effects (direct or indirect) to NHTs under Section 106 of the NHPA would be mitigated as stipulated in the Programmatic Agreement. The HPMP will be consistent with the Secretary's Standards, the ACHP's 2009 Section 106 Archaeology Guidance, all applicable NPS guidance for

evaluating and documenting historic properties (e.g., Guidelines for Evaluating and Documenting TCPs and Guidelines for Evaluating and Documenting Rural Historic Landscapes), BLM Manual guidance, and state guidelines. Mitigation efforts for adversely affected historic properties in Navy property will be dealt with differently and adverse effects will be mitigated per Navy consultation with the sovereign tribal governments and state. Potential adverse effects on historic properties of religious and cultural significance to Indian tribes were identified by the Navy in consultation with the CTUIR. The Navy, Oregon SHPO, CTUIR, and ACHP prepared a Memorandum of Agreement (October 2015) to resolve potential adverse effects on the aforementioned resources and establish protocols for protection and management of these resources in accordance with Section 106 of the NHPA.

On completion of the Class III inventory, micro-siting of the route will be conducted to avoid and minimize impacts on historic properties to the extent possible. An HPMP will be developed for considering and managing adverse effects on historic properties resulting from activities associated with constructing, operating, and maintaining the proposed B2H Project. The HPMP will present mitigation options for anticipated types of historic properties that may be affected by the B2H Project. The HPMP, including protection measures, property-specific mitigation plans, and monitoring plans, will be finalized prior to the Notice to Proceed and will be included in the POD. The HPMP will be developed in consultation with the parties to the Programmatic Agreement (Appendix I).

The draft HPMP will characterize historic properties identified within the APE and will be used as a guide to address pre-construction and post-construction treatment measures to avoid, minimize and mitigate adverse effects on historic properties identified through subsequent phases of the B2H Project. The draft HPMP also will broadly identify classes of historic properties, relevant research, and potential data gaps for properties present in the study corridor. A range of resource-specific (e.g. historic trails) strategies will include mitigation and monitoring to address reasonably foreseeable direct, indirect and/or cumulative adverse effects that may be caused by the B2H Project. The mitigation measures will be commensurate with the nature of the effect and the significance of the resource, and will take into account the views of the parties to the Programmatic Agreement and the public. The BLM will consult with the parties to the Programmatic Agreement to obtain written comments and recommendations for proposed treatment measures to be included in the HPMP, and will develop a process for review and acceptance of mitigation to be outlined in the HPMP.

Wherever feasible, avoidance and preservation will be the preferred method to eliminate or reduce adverse effects on historic properties. Avoidance may include B2H Project design changes or relocation of specific components of the B2H Project and/or the use of fencing or barricades to limit access to identified historic properties. For historic properties that cannot be avoided, the HPMP will include plans and provisions to minimize or mitigate direct, indirect, and/or cumulative adverse effects on historic properties. Appropriate site mitigation will be established in consultation with SHPOs, THPOs, involved land-managing agencies, Native American sovereign tribal governments, and consulting parties as appropriate.

The HPMP also will include measures to protect identified historic properties from adverse effect that may result from the B2H Project. These measures may include placement of barricades and fencing

(as previously mentioned), notices to law enforcement, seasonal restrictions, and other appropriate measures.

Mitigation plans proposed for cultural resources are as follow. Refer also to the Programmatic Agreement (Appendix I).

- All historic properties adversely affected by the B2H Project will be subject to property-specific mitigation plans to be drafted after issuance of the ROD to resolve adverse effects as determinations of effect are made for these properties. The mitigation plans will be included in the final HPMP.
- Mitigation plans will include appropriate measures to resolve adverse effects on the qualities of the historic property that make it eligible for listing in the NRHP.
- For effects on archaeological sites that will be mitigated through data recovery, mitigation plans will include a research design that articulates research questions; data needed to address research questions; methods to be employed to collect data; laboratory methods employed to examine collected materials; and proposed disposition and curation of collected materials and records.
- Mitigation plans for direct effects on historic properties eligible for listing in the NRHP under criteria other than or in addition to Criterion D will articulate the context for assessing the properties' significance, an assessment of the character-defining features that make the property eligible for listing in the NRHP, and an assessment of how the proposed mitigation measures will resolve the effects on the property.
- Mitigation plans for indirect effects on historic properties eligible under any NRHP criteria will include an assessment of the character-defining features that make the property eligible for listing in the NRHP; the nature of the indirect effect; an evaluation of the need for long-term monitoring; and an assessment of how the proposed mitigation measure(s) will resolve the effects on the property.
- Mitigation measures for direct effects on historic properties will be included in the approved HPMP for the B2H Project and may consist of archaeological data recovery and/or preparation of Historic American Building Survey, Historic American Engineering Record, or Historic American Landscape Survey documentation as appropriate.
- Mitigation plans for direct, indirect, and cumulative effects on historic properties may include:

  Completion of NRHP nomination forms
  Interpretive or educational materials in a variety of media formats
  Partnerships and funding for historic properties interpretation
  Conservation easements
  Purchase of land for long-term protection of historic properties

Additionally, monitoring plans for cultural resources will be developed as a subsection of the HPMP for implementation during construction, operation, and maintenance of the B2H Project. Refer also to the Programmatic Agreement (Appendix I). This plan will address monitoring for compliance with stipulations of the HPMP, as well as a potential strategy to avoid, minimize, or mitigate direct, indirect, and/or

cumulative adverse effects on historic properties. All monitoring plans will identify monitoring objectives and the methods necessary to attain these objectives and in particular address those areas determined under the inventory to show a high probability for buried cultural deposits. Any cultural resources, human remains, or funerary objects discovered at any time during construction, construction monitoring, or operation and maintenance activities of the B2H Project will be treated in accordance with the Inadvertent Discovery Plan contained in the HPMP.

3.2.13.5 CULTURAL CONTEXT

The following overview is presented to introduce the reader to the diverse geography of the B2H Project area and the pattern of human activity visible on the landscape. The overview provides a general presentation of pre-contact chronologies of the Columbia Plateau and Great Basin regions through information gathered by previous archaeological research. It also presents information on the historic period development of the area in terms of the important socioeconomic themes that have shaped the landscape (e.g., road, rail, and trail transportation; mining; timber and logging; homesteading; agriculture; stock raising; and military occupations).

It is important to note that the distinction made between “pre-contact” and “historic” resources is an artificial one that is based, for the most part, on the source of data that informs each time period. The concept of “pre-contact” is a term that is used in the field of archaeology and that characterizes human society and cultural patterns through material comparisons. Determining what constitutes the “historic” period differs from region to region, as the term “historic” simply marks the time at which written records become available. The murkiness of the pre-contact concept becomes particularly evident when dealing with the period of time many researchers identify as the “protohistoric.” This is a time when European Americans encountered and documented many Native American groups; however, these groups did not keep written records themselves and, therefore, protohistoric records are often biased or unreliable accounts.

Ethnography is the descriptive study of living cultures by anthropologists and, in the U.S., is often used to characterize the social and economic organization of Native American groups living in a region prior to the arrival of European-American individuals and groups. Many Native American tribes, including groups consulted with for the B2H Project, have indicated a concern with the artificial division between history and pre-contact, citing that it characterizes traditional lifeways as “historic” and fails to recognize the continuity of cultural practices that Native American tribes engage in as living communities. Although the overview presented here does adopt the distinction between pre-contact and historic resources, the authors of the EIS have chosen to begin this discussion with an ethnographic summary of the traditional lands of Native American groups living in the B2H Project area at the time of European-American contact. It is hoped that the structure of this presentation will facilitate an appreciation that the archaeology present in the B2H Project area is a manifestation of deeply rooted Native American cultural traditions that continue to be practiced today. Contemporary concerns of Native American sovereign tribal governments have been communicated to the BLM through government-to-government consultation and are discussed in various sections of the EIS, including Earth Resources (Section 3.2.1), Vegetation Resources (Section 3.2.3), Wildlife Resources (Section

3.2.4), Fish Resources (Section 3.2.5), Land Use (Section 3.2.6), Recreation (3.2.8), Transportation (Section 3.2.9), Native American Concerns (Section 3.2.14), Socioeconomic and Environmental Justice (Section 3.2.17), and Public Health and Safety (Section 3.2.18).

The ethnographic and archaeological overviews presented follow the convention of distinguishing cultural patterns by ecological zone, as established through the work of noted anthropologist Julian Steward (1938), whose work documenting Native American tribes of the Columbia Plateau and Great Basin is considered foundational in the field of anthropology. However, as Steward himself noted, the boundaries of these two zones were not fixed; the highly mobile groups in the Great Basin and Snake River Plain resulted in a complex web of interaction and relationships that challenged European-Americans' efforts to document discrete Native American tribes. Accordingly, early attempts to characterize ethnic boundaries by language, diet, territorial range, or political affiliation in historical accounts are conflicting. The alienation of many Native American tribes from their traditional lands and the establishment of reservations by the U.S. Government in the late nineteenth century further complicate the use of the Plateau and Great Basin as a conceptual framework for assigning traditional use of these lands to one or more contemporary Native American tribes.

ETHNOGRAPHIC OVERVIEW OF THE COLUMBIA PLATEAU

Ethnographic information on the Columbia Plateau has been summarized by a number of sources, including Ames et al. (1998), the CTUIR (n.d.a), Hanes (1995), Ruby and Brown (1972), Stern (1998), and Suphan (1974). In the Columbia Plateau region, the B2H Project traverses the traditional territories of the Western Columbia River Sahaptins; the Umatilla, Cayuse, and Walla Walla tribes; and the Nez Perce Tribe (Map 3-6). The ethnographic descriptions of these groups and their written history are summarized below.

Western Columbia River Sahaptins

The village communities historically documented along the Columbia River and its tributaries from near The Dalles, Oregon, to Alder Creek, Washington, are characterized as comprising the Western Columbia River Sahaptins (Hunn 1990a; Hunn and French 1998:378–379). These groups spoke the Columbia River dialect of the Sahaptin language, as did the Umatilla who resided to the east and the Yakama who occupied territory to the north. The Chinookan-speaking Wasco, Wishram, and Cascades resided to the west, though use of these areas overlapped (French and French 1998; Hunn 1990a; Schuster 1998; Stern 1998).

Map 3-6

Columbia Plateau Tribal Territories

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

Project Area Boundary

Cultural Features

Tribal Territory

General Reference

State Boundary

SOURCES:
Columbia Plateau Tribal Territories, Walker 1998;
State Boundaries, ESRI 2013

NOTES:
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Sahaptin villages consisted of politically autonomous groups. Village communities of Sahaptin speakers were found along the Columbia River and its tributaries (Hunn and French 1998:378–379), though use of this area overlapped with neighboring groups, including the Nez Perce (French and French 1998; Hunn 1990a; Schuster 1998; Stern 1998). The traditional Sahaptin economy was based on seasonal rounds, with subsistence and settlement systems dependent on topography and the availability of resources in an area. The Western Columbia River Sahaptins wintered in villages at favorable fishing sites along the Columbia and its tributaries. Families spent much of the spring, summer, and fall in seasonal camps procuring food. This ecological adaptation provided an abundant resource base until smallpox epidemics of the late 1700s and the subsequent arrival of European-American settlers in the mid-1800s severely disrupted traditional cultural patterns. Sahaptin-speaking communities were further fractured in the reservation era with the signing of the 1855 *Treaty with the Tribes of Middle Oregon* and removal of the Wasco, Tenino, and Northern Paiute peoples to the Warm Springs Reservation (Treaty with the Tribes of Middle Oregon 1855). Treaty boundaries arbitrarily divided traditional territories, leaving social networks and many families divided.

For thousands of years, the culture of Native Americans living on the Columbia Plateau intimately has been tied to the life cycle of salmon (Chatters and Pokotylo 1998:73). The timing of upstream migrations, location of fishing sites, and the quantity and quality of salmon largely determined settlement patterns and seasonal mobility among Columbia Plateau peoples. During much of the year, Plateau peoples moved throughout their traditional territories in response to seasonal availability of foods and other subsistence resources. Co-utilization of resources by various Native American tribes was common throughout the region, with no formal construct of resource or spatial ownership (Suphan 1974:74), although local bands might have claimed principal rights to prime fishing spots near their winter villages (Stern 1998:400).

While a small area of the Western Columbia River Sahaptins' traditional territory directly intersects the B2H Project area, these lands, located in the extreme west end of the B2H Project area, have been ceded (Map 3-6).

Umatilla, Walla Walla, and Cayuse

The Umatilla and Walla Walla also are Sahaptin-speaking tribes. The Umatilla historically were settled along both sides of the Columbia River in the vicinity of its confluence with the Umatilla River. The Walla Walla generally was located farther to the north, occupying lands along the Yakama, Walla Walla, and Snake rivers in present-day Washington. The Waiilatpuan-speaking Cayuse resided farther to the south along tributaries of the Umatilla and to the east of the Blue Mountains, where their territory overlapped with that of the Sahaptin-speaking Nez Perce (Walker 1998).

The establishment of Fort Nez Perce, later renamed Fort Walla Walla, in 1818 along the lower Walla Walla River and the 1836 Whitman Mission disrupted established trade ties in the region and accelerated further loss of population through disease. The following decades would be tumultuous, marked by incidents of violence between Native American tribes and European Americans. The Umatilla Indian Reservation was created by the *Treaty between the Cayuse, Umatilla, and Walla Walla*

Tribes, in Confederation, and the United States in 1855, under which the Cayuse, Umatilla, and Walla Walla ceded more than 6 million acres of their traditional territory in northeast Oregon and southeast Washington (Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855). Today the Umatilla Reservation is approximately 172,000 acres (69,600 hectares) (CTUIR n.d.b). Situated at major river confluences, the Umatilla, Cayuse, and Walla Walla were located ideally to act as trade "middlemen" among people of the Great Plains and the tribes of the western valleys and Pacific coast. Interaction, including trade and intermarriage, with Western Columbia River Sahaptin people was frequent, as their territory was located downriver (Stern 1998:647). With the adoption of the horse as a major cultural focus, the Cayuse enjoyed a more expansive subsistence area, which may have ranged eastward into the Great Plains (Hanes 1995). Kinkade et al. (1998:61) noted that by the early 1830s, the Cayuse language was no longer spoken due in part to a decline in population and extensive intermarriage with the Nez Perce and Umatilla.

Traditional territories of the Cayuse, Umatilla, and Walla Walla intersect the B2H Project area over a long distance, from the vicinity of Huntington to the vicinity of Boardman (Map 3-6).

A majority of the B2H Project area is located in lands ceded to the U.S. Government in the Treaty of 1855 with the Cayuse, Umatilla, and Walla Walla, 12 Stat. 945. The CTUIR have reserved explicit hunting, fishing, gathering, and pasturing rights in that treaty and the CTUIR actively work with the U.S. Government in natural resources planning efforts to protect their off-reservation treaty rights (Phinney and Karson 2007).

Nez Perce

Before incursions by European Americans, the Nez Perce occupied a vast territory, stretching from the Lochsa River in western Montana to the eastern Blue Mountains and south to the Weiser River and the headwaters of the south and middle forks of the Salmon River in central Idaho. The seasonal migrations, housing, food, storage, and basketry of the Nez Perce were similar to that of other southern Columbia Plateau groups.

The Nez Perce practiced a seasonal subsistence cycle. In the spring, women traveled to the lower valleys to dig root crops while men traveled to the Snake and Columbia rivers to fish during the salmon runs. By midsummer, groups moved to mountain areas to gather berries, fish in the streams, and hunt big game. With the adoption of the horse after Anno Domini (A.D.) 1700, some men would travel to the Montana plains to hunt bison. By November of each year, the groups returned to their traditional villages along the Snake, Clearwater, and Salmon rivers.

Like the Umatilla and Walla Walla, the Nez Perce also are Sahaptin speakers. Bands of Nez Perce participated in the *Nez Perce Treaty of 1855*, ceding large portions of their lands to the U.S. Government in exchange for reserved lands (Treaty with the Nez Perce 1855). The discovery of gold on Nez Perce lands in 1860 spurred the U.S.'s decision to press for a renegotiation of this treaty in 1863 with the *1863 Nez Perce Treaty* to reduce reserved lands to the approximately 1,000 square miles of what subsequently was deemed the Lapwai Reservation, just east of the Oregon and Idaho border (Treaty with the Nez Perce 1863). Many bands of Nez Perce, especially those bands who had relatives

among the Umatilla, refused to enter into this treaty. The band led by Chief Joseph (the elder) remained in the Wallowa Valley, but by 1877 the Nez Perce had been pushed out of the Wallowa Valley. Displaced and beleaguered by internal and external conflict, the Wallowa bands commenced a three-month-long fight variously referred to as the Nez Perce War and Chief Joseph's War. This fight eventually would find the Nez Perce in Montana, where in October of 1878, Chief Joseph (the younger) would surrender to the U.S. Government (Ruby and Brown 1981). Nez Perce captives eventually would be sent to Oklahoma and would remain at the Ponca Agency in Indian Territory until 1885. After impassioned lobbying from Nez Perce leaders, including Yellow Bull and Chief Joseph (the younger), families of Nez Perce were allowed to return to the reservation at Lapwai. Families of the Joseph Band were resettled at Colville, where they became part of the Confederated Tribes of the Colville Reservation (Hanes 1995). Today, descendants of the Nez Perce live on the Colville, Lapwai, and Umatilla Reservations.

Traditional territories of the Nez Perce intersect the B2H Project area in the vicinity of Elgin and the southern Wallowas (Map 3-6). The Tribe ceded lands in present-day eastern Baker and Wallowa counties, east and north of the B2H Project area.

ETHNOGRAPHY OF THE NORTHERN GREAT BASIN

In the northern Great Basin, the B2H Project traverses the traditional territories of at least three Native American groups, including traditional lands of the Western Shoshone, the Northern Shoshone-Bannock, and the Northern Paiute. Although the commonly held traditional boundary of the Western Shoshone is located just south of the B2H Project area, interaction likely occurred among the Northern Paiute, Bannock, and Northern Shoshone (Map 3-7). These three groups spoke mutually intelligible varieties of Central and Western Numic dialects, a component of the Numic branch of the Uto-Aztecan language family. The Central Numic embraces three distinct languages: Panamint, Shoshone, and Comanche; the Western Numic includes two languages: Mono and Northern Paiute (Casad and Willett 2000:293).

Evidence of Shoshone occupation also is present in the Upper Snake and Salmon River region as a subarea of the Great Basin culture area. The apparent continuity of aboriginal settlement and subsistence patterns through the Holocene was affected by the introduction of the horse in the mid-1700s, which afforded Numic groups enhanced mobility for hunting far-ranging bison herds (Steward 1938:201). Ethnohistoric studies indicate that following the introduction of the horse, aboriginal groups residing in the Snake River Plain were highly mobile and ranged across not only the Great Basin and the Columbia River Plateau but also onto the Great Plains.

Two treaties were signed between the Western Shoshone and the U.S. Government in 1863: one treaty with the Goshute and the other (the *Treaty of Ruby Valley*) with the Western Bands of Shoshone, which included language to differentiate the Goshute from all other Western Shoshone (Stewart 1978; Treaty between the United States of America and the Western Bands of Shoshone Indians 1863). This treaty is particularly contentious as it did not state that the Western Shoshone were required to surrender their lands, with a legal battle fought for land rights continuing since at least 1951 (Thomas et al. 1986:263).

In 1877 the Western Shoshone were ordered to relocate to the Duck Valley Indian Reservation, which was established by executive order near the border of Idaho and Nevada (Shoshone-Paiute Tribes of the Duck Valley Indian Reservation 2016).

While admittedly arbitrary, traditional territories of the Western Shoshone do not intersect the B2H Project area (Map 3-7).

Northern Shoshone and Bannock

At the time of European American arrival in the mid-nineteenth century, much of Idaho was home to the Northern Shoshone and Bannock tribes. The Northern Shoshone and Bannock occupied much of the Snake River Plain, ranging from the Nevada and Utah borders to the south, the Wyoming border to the east, the Oregon border to the west, and the Salmon River to the north (Murphy and Murphy 1986:287).

Hanes (1995) notes that the Northern Shoshone are often referred to as “Snake” Indians in historic accounts, based on their close association with the lands and resources of the Snake River. The ethnographic territory of several groups of Northern Shoshone shared much the same material culture and social organization with the Northern Paiute. In southwestern Idaho, Northern Shoshone populations also were centered on the Boise, Weiser, and Payette River drainages. Other Shoshone groups practicing a more sedentary fishing economy were settled in the Boise and Bruneau River valleys. Still other bands of Shoshone, some identified as “Sheepeater” or “Lemhi” in historic accounts, focused subsistence on hunting and gathering of mountain resources (Murphy and Murphy 1986:288).

The Bannock historically have been associated with the Northern Shoshone and share many cultural similarities; however, the Bannock spoke a different Shoshone dialect and relied on the horse as a key element of their subsistence and culture. The use of horses in the mid-1700s allowed for the expansion of Bannock hunting territories as far north as Canada and east into Montana and Wyoming from their territories in Idaho (Steward 1938).

The *Fort Bridger Treaty of 1868* settled families of Shoshone and Bannock tribes on the Fort Hall Reservation (Treaty with the Eastern Band Shoshoni and Bannock 1868). In exchange for yielding their traditional territories, the Shoshone and Bannock reserved through the treaty certain rights outside of their reservation boundaries, including hunting, fishing, gathering, and grazing. In 1907 additional families were relocated to Fort Hall from the Lemhi Reservation after it was disbanded (Hanes 1995). Some Shoshone and Bannock families who had lived along the Owyhee River settled on the Duck Valley Reservation (Shoshone-Paiute Tribes of the Duck Valley Indian Reservation 2016). Later they were joined by Paiute from the Weiser area, southeast Oregon, Idaho, and the Yakama Reservation. The tribes composing the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation did not sign the *Fort Bridger Treaty of 1868* and claim ancestral title to lands in the B2H Project area.

Traditional territories of the Northern Shoshone and Bannock groups intersect the B2H Project area in the vicinity of Wilson and along the northern periphery of the Owyhee Mountains. The Tribe ceded lands in present-day Owyhee and Canyon counties, south and north of the B2H Project area in Idaho (Map 3-7).

Map 3-7

Great Basin Tribal Territories

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Project Features

Project Area Boundary

Cultural Features

Tribal Territory

General Reference

State Boundary

SOURCES:
Great Basin Tribal Territories, d'Azevedo 1986;
State Boundaries, ESRI 2013

NOTES:
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Northern Paiute

The people known today as Northern Paiute are descendants of culturally distinct groups sharing a common language. At the time of European-American contact, the Northern Paiute ranged from southeastern Oregon east into southwestern Idaho and south into northwestern Nevada, encompassing much of the Owyhee Uplands. The Northern Paiute represent the most northern extent of the Great Basin cultural complex. In the north, this complex was highly influenced by long-standing traditions of travel, trade, intermarriage, and co-utilization of resources with Columbia Plateau peoples living in the Blue Mountains and the Owyhee Uplands (Stewart 1941).

Some Northern Paiute bands in eastern Oregon and along the Snake River Plain obtained horses sometime in the mid-1700s. Other bands of Northern Paiute did not adopt use of the horse and focused instead on hunting and gathering resources (Stewart 1941).

The 1878 Bannock War, which ultimately resulted in the forced march of approximately 550 Paiute and Bannock people from Fort Harney 250 miles north to Fort Simcoe, Washington, on the Yakama Reservation (Ruby and Brown 1981), has been partially ascribed to the loss of access to the culturally significant and economically vital Camas Prairie in southern Idaho. Paiute chronicler Sarah Winnemucca Hopkins documented the circumstances of the Forced March of 1879, stating that: “They were poorly clad. Children froze to death, and mothers died during childbirth along the way. The Indians were not even allowed to bury their dead. On February 2, 1879, 543 Paiutes stumbled into the Simcoe Agency, where they were herded into cold sheds, ’like so many horses and cattle’” (Ruby and Brown 1981:255). Historical documentation from Winnemucca Hopkins and Indian Agent W.V. Rinehart indicates that the route of the Forced March of 1879 would have followed a northwesterly trajectory. However, Shoshone-Paiute tribal history indicates that the Oregon Trail through the B2H Project area was a part of the route that their people traveled during the forced march, when people were gathered from the Boise and Weiser areas.

Traditional territories of the Northern Paiute intersect the B2H Project area in the vicinity of Huntington and Lake Owyhee (Map 3-7). The Tribe has ceded lands in present-day Malheur and Wallowa counties, west and south of the B2H Project area. Many Northern Paiute also settled on the Duck Valley Reservation after an 1886 Executive Order which expanded the reservation (Shoshone-Paiute Tribes of the Duck Valley Indian Reservation 2016).

TRADITIONAL FOODS

A discussion of traditional foods is included here as these resources relate to the B2H Project. Traditional foods used by the represented southern Columbia Plateau and northern Great Basin tribes are discussed here through a cultural perspective with a broad ethnographic review rather than simply including an exhaustive list of the many plant and animal resources used by each individual group. Refer to Sections 3.2.3, 3.2.4, and 3.2.5 for a discussion of these resources from the perspective of vegetation, wildlife, and fish resources, respectively.

As the people of the southern Columbia Plateau and northern Great Basin express that natural resources and cultural resources are one and the same, these resources cannot be separated. This connection is visible through many aspects of available recorded culture; through the many linked practices and traditions observed in the ethnographic record (Fowler 1986; Ray 1942; Steward 1938, 1943; Stewart 1941); through the ways in which tribes negotiated and continue to negotiate (sometimes aggressively) lasting access to traditional hunting and gathering areas in treaty documents (Center for Columbia River History [CCRH] 2016a; Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855; Treaty between the United States of America and the Eastern Bands of Shoshonee Indians 1863; Treaty with the Eastern Band Shoshoni and Bannock 1868; Treaty with the Nez Perce 1855, 1863); and through the modern resurgence in requiring that intergovernmental treaties and aboriginal rights be honored, re-establishing healthy waterways for fish and plant resources, along with the education of inter-tribal groups to better feed and nourish their communities through knowledge of and access to traditional foods (Center for Disease Control and Prevention 2013; Columbia River Inter-Tribal Fish Commission 2014a; Confederated Umatilla Journal 2008; Institute for Tribal Environmental Professionals 2007; Shelley 1999).

Several southern Columbia Plateau and northern Great Basin groups express a spiritual link with traditional foods, many of which play a central role in tribal creation beliefs and individual ceremonies and rituals (including the First Salmon Ceremony among the Spokane and other Plateau tribes), as well as a spiritual and practical connection to place, with migration following the seasonality and availability of traditional plant and animal foods (CTUIR n.d.c; Confederated Umatilla Journal 2008:22; Drummond and Steele 2013; Institute for Tribal Environmental Professionals 2007; Ray 1942:15). Beyond the nutritional and cultural need for these resources, traditional foods have and continue to facilitate and foster relationships among neighboring and regional groups through trade and exchange (CCRH 2016b; Columbia River Inter-Tribal Fish Commission 2014b, 2014c; Drummond and Steele 2013).

From the time of first contact with Europeans through the era of treaties, southern Columbia Plateau and northern Great Basin groups emphasized the need for continued access to traditional hunting and gathering grounds; many treaties containing language similar to that found in the *Statutes of the Confederated Tribes of the Umatilla Indian Reservation*, which states that these groups may hunt “at all other usual and accustomed stations in common with citizens of the United States” (CCRH 2016a; Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855; Treaty between the United States of America and the Eastern Bands of Shoshonee Indians 1863; Treaty with the Eastern Band Shoshoni and Bannock 1868; Treaty with the Nez Perce 1855, 1863). Although many regional groups not already expressly discussed do not have treaties that explicitly protect themselves, all tribal communities in the area are similarly protected “through the United States Constitution, federal treaties, federal unratified treaties, executive orders, inherent rights, and aboriginal title to the land” (Hauser 2015:1).

Since making these treaties and agreements, the production of, access to, and health of traditional foods has suffered. One of the hardest hit resources has been fish, due in large part to dam creation and irrigation allotment, limiting the water present in many regional rivers and creeks (CCRH 2016b,

2016c). Since the 1960s, legislation, legal agreements, and cooperative initiatives have made a significant positive impact on the access to and overall health of traditional food resources. One noteworthy piece of legislation, particularly for the regional southern Columbia Plateau and northern Great Basin groups, is *United States v. Oregon*. *United States v. Oregon* is an ongoing federal proceeding that enforces and implements a 1969 decision that found that area tribes have absolute fishing rights in the Columbia River system while the state has limited power to restrict or regulate tribal access (NOAA Fisheries n.d.).

Numerous proposals and rehabilitation projects have been considered in the recent past, including proposals to draw down dams (CCRH 2016d, 2016e), proposals to prioritize spawning grounds and re-water areas from other water sources (CCRH 2016a; Shelley 1999), petitions for the federal protection of Sockeye (CCRH 2016e), and proposals to create new fishing stations (Columbia River Inter-Tribal Fish Commission 2014c), among many others. While much of the legal action undertaken in the last 50 years has focused on traditional fish resources, the legal and federal upholding of fishing rights simultaneously validates and protects treaty-sanctioned access to traditional vegetation and wildlife resources as well.

More recent efforts to achieve access to the appropriate volumes of traditional foods protected through treaties and aboriginal rights include the calculation of heritage consumption rates, most notably with fish. Contemporary consumption rates are much lower than heritage numbers due to the contamination of waterways and fish, limited access to fishing sites, and reduced fish populations through loss of habitat, dams, and development. While heritage rate calculations vary considerably among individual southern Columbia Plateau and northern Great Basin groups, they serve as a guideline to help achieve balance between traditional foods consumption and legal efforts (Harper and Walker 2015). Heritage projections estimate that Columbia Plateau tribes consumed between 365 and 800 pounds of fish per capita with an average of 1.6 pounds per day, making up one-third to one-half of their pre-contact food supply (Harper and Walker 2015; Scholz et al. 1985:77; Walker 1967).

Given recent strides to achieve traditional food and resource equitability, many southern Columbia Plateau and northern Great Basin tribal members have had the opportunity to achieve greater economic stability as well as greater food stability and access to healthier foods; which has allowed, and continues to allow for greater connection to their individual traditional practices. It has been reported among some Columbia Plateau groups that more tribal members than ever before are working as fishermen, fish technicians, biologists, hatchery managers, and research scientists in addition to using other skills to aid in environmental restoration and promote traditional lifeways (Columbia River Inter-Tribal Fish Commission 2014c; Harper and Walker 2015). Along with increased economic stability, tribal members have increased food stability, along with the availability of more healthful foods, when individual groups have greater access to hunt and gather traditional foods themselves; this is of particular importance in more isolated areas known as food deserts (Center for Disease Control and Prevention 2013:3–4; Columbia River Inter-Tribal Fish Commission 2014b). Lastly, a greater knowledge of traditional foods and traditional practices enables groups and individuals to pass down and perpetuate traditional values and practices, a key element in bringing an otherwise simple

discussion of food back to a more meaningful cultural perspective on traditional foods (Center for Disease Control and Prevention 2013:29; Columbia River Inter-Tribal Fish Commission 2014b; Drummond and Steele 2013; Institute for Tribal Environmental Professionals 2007). A meaningful explanation of this relationship is detailed by Elise Krohn, Traditional Plants Educator at Northwest Indian College, stating that “We know that native foods and medicines promote health, but they also feed peoples spirits, bring different generations together, cultivate relationships with the land, and build cultural identity” (Center for Disease Control and Prevention 2013:29).

As previously stated, an exhaustive list of the many plant and animal resources used by each individual group is not covered here. Refer to Sections 3.2.3, 3.2.4, and 3.2.5 for a discussion of these resources from the perspectives of vegetation, wildlife, and fish resources, respectively. However, a few of the most discussed resources (in the ethnographic record as well as by tribal members today) are included briefly as a part of this discussion.

Vegetation

Vegetation consists of the largest and most diverse group of resources in this discussion of traditional foods. The most commonly used plant foods among southern Columbia Plateau and northern Great Basin groups are roots and berries. Plant foods commonly are thought to be more stable and reliable resources than most animal foods but generally lack the same prestige. Collected roots can be dried and preserved or ground and combined with water, fat, or other preserved food to make cakes or biscuits. Roots commonly harvested in the region include bitterroot, camas, celery, onion, biscuitroot, and yampah (CTUIR n.d.c; Drummond and Steele 2013; Moerman 1998; Quaempts et al. 2007; Ray 1942:131; Steward 1938:23). Berries can either be eaten raw or can be dried and preserved for later use. Berries commonly gathered include chokecherry, currant, huckleberry, and serviceberry (CTUIR n.d.c; Drummond and Steele 2013; Moerman 1998; Quaempts et al. 2007; Ray 1942:132–133). Additional vegetal food resources include pine, sunflowers, and cattail (Fowler 1986:69–74; Moerman 1998; Ray 1942:132; Steward 1943:301; Stewart 1941:374–375).

Many of the plants found in the region were documented in various ethnographic accounts as food, medicine, construction materials, and technological resources, including roughly 135 species that were consumed and 125 species that served more functional purposes (Hunn et al. 1998:526, 531), many of which remain relevant today. Many accounts have been documented in both the archaeological (Aikens et al. 2011; Ames et al. 1998; Grayson 2011; Lovell et al. 1986) and ethnographic (Fowler 1986; French 1965; Hunn 1990b; Hunn and French 1998; Hunn et al. 1998; Marshall 1977; Moerman 1998; Murphy and Murphy 1986; Ray 1942; Schuster 1998; Shimkin 1986; Stern 1998; Steward 1943; Walker 1998) records for the region. While these records should be consulted for a more in-depth review, known economic uses for some of the more common plant resources are presented in Table 3-437.

Table 3-437. Common Plant Types Recovered from Regional Archaeological Sites	
Plant	**Ecological Utility**
Pine (*Pinus albicaulis, Pinus contorta, Pinus ponderosa*)	Pine pitch can be used as a medicinal emetic and as a starvation food resource that was chewed. It also traditionally was used to seal baskets. The wood commonly is used for construction.
Juniper (*Juniperus occidentalis, Juniperus scopulorum*)	The small berries, which are blue-to-purple in color, are often mixed with other foods. The twigs, leaves, and bark can be used in tea, dyes, cordage, and textiles. The wood can be used as construction material for bows and is used as fuel.
Serviceberry (*Amelanchier alnifolia*)	The reddish-purple berry is an edible fruit. The wood has been known to be used to make bows, digging sticks, and arrow fore-shafts.
Mountain mahogany (*Cercocarpus ledifolius*)	The branches can be used for bows, digging sticks, hoes, dyes, and construction materials.
Ephedra (*Ephedra nevadensis, Ephedra viridis*)	The twigs can be used for dyes and as a stimulant tea.
Indian ricegrass (*Achnatherum hymenoides*)	Common as an edible plant throughout the Columbia Plateau, these grasses produce very small, hard seeds at the top of the plant that can be roasted and ground into meal.
Sagebrush (*Artemisia arbuscular, Artemisia nova, Artemisia papposa, Artemisia rigida, Artemisia spiciformis, Artemisia spinescens, Artemisia tridentate, Artemisia tripartita*)	These plants produce very small seeds that are known to have been eaten by aboriginal populations in California. The bark and branches can be used as fuel, clothing, textiles, and dyes, and the leaves can be eaten or boiled into drinks.
Rabbitbrush (*Ericameria nauseosa*)	The branches, flowers, and bark are used mostly as fuel and to make dyes. The branches also can be used as arrow fore-shafts.
Greasewood (*Sarcobatus vermiculatus*)	This plant produces very small edible seeds that serve as a food resource in times of scarcity, despite the many spines that make the seeds difficult to collect. The branches can be used as fuel, dyes, rabbit sticks, arrow fore-shafts, digging sticks, and construction materials.
Saltbush (*Atriplex canescens*)	Like greasewood, this plant produces a very small edible seed that, along with the leaves of the shrub, can serve as a food resource in times of resource scarcity. This plant also has many spines that make the seeds difficult to collect. Seeds often are cooked like oatmeal, and the leaves are either eaten raw or cooked. The ashes of the plant also can be used as a leavening ingredient for breads or in making lye to soften the hulls of corn.
Willow (*Salix L. spp.*)	The wood can be used in basketry, bow and arrow main-shafts, and cradleboard frames. The leaves may be used to make dyes.

Wildlife

Wildlife consists of the large category of all animals that are not fish, most of which consist of mammals and birds. The hunting of large mammals was at least somewhat dependent on the availability, or lack thereof, of other animal resources, particularly fish, and was documented in ethnographic accounts as more common for those groups closer to the American Plains and in the northern Great Basin (e.g., the Nez Perce [Walker 1998], Northern Paiute [Fowler 1986; Stewart 1941], Northern Shoshone [Fowler 1986; Steward 1943]), and when general aridity was less of a limiting factor (Steward 1938:33), although hunting was documented as an important cultural activity among all regional groups. Meat was, and is still, often dried or smoked and preserved for later use. Mammals commonly hunted in the region include deer, elk, pronghorn, mountain goat, and rabbit (CTUIR n.d.c; Drummond and Steele

2013; Fowler 1986:80–81; Quaempts et al. 2007; Ray 1942:116; Steward 1938:34–39, 1943:292–296; Stewart 1941:371); birds commonly hunted in the region include dove, quail, duck, mud hen, and sage hen (Fowler 1986:85–87; Steward 1943:299; Stewart 1941:372); additionally, reptiles and insects were reportedly used as food (Fowler 1986:92; Steward 1938:23, 1943:299–300; Stewart 1941:373).

Many of the animals found in the region were used ethnographically as food, medicine, and technological resources, with many of these purposes still relevant today. Many accounts have been documented in both the archaeological (Aikens et al. 2011; Ames et al. 1998; Grayson 2011; Lovell et al. 1986) and ethnographic (Fowler 1986; French 1965; Hunn 1990b; Hunn and French 1998; Hunn et al. 1998; Marshall 1977; Moerman 1998; Murphy and Murphy 1986; Ray 1942; Schuster 1998; Shimkin 1986; Stern 1998; Steward 1943; Walker 1998) records for the region. While these records should be consulted for a more in-depth review, known economic uses for some of the more common faunal resources are presented in Table 3-438.

Table 3-438. Common Animals Recovered from Regional Archaeological Sites

Animal(s)	Ecological Utility
Deer (*Odocoileus hemionus hemionus, Odocoileus virginianus leucurus, Odocoileus virginianus ochrourus*)	The hides can be made into buckskin clothing, including breechcloth, shirts, dresses, leggings, and moccasins, as well as quivers, tumplines, bags, caps, and cradleboards. Deer sinew is reportedly preferable for bowstrings and also can be used for hafting projectile points to shafts and sewing clothing. The bones can be used to make awls, needles, and fishing hooks and can be can be used to shape arrow shafts. The hooves can be dried to make rattles and boiled to make glue. While there are many uses for deer, its meat also is valued.
Beaver (*Castor canadensis*)	The fur is of interest for cold-weather clothing. The bones can be shaped into a variety of implements, including spear points and other cutting devices. The teeth can be used as gaming pieces. While beaver are more appreciated for their fur, their meat also is consumed.
Horse (*Equus ferus caballus*)	The bones can be shaped into a variety of implements, including spear points and other cutting devices, and can be used to keep hides taut for tanning.
Fox (*Vulpes velox, Vulpes vulpes*), wolf (*Canis lupus linnaeus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), mink (*Mustela vison*), badger (*Taxidea taxus*), otter (*Lutra canadensis*), and bobcat (*Lynx rufus*)	These fur-bearing animals have been hunted with greatest interest in their skins (e.g., to create winter clothing, robes, blankets, bags, carrying cases, hats, and mittens), with their flesh consumed somewhat more incidentally.
Porcupine (*Erethizon dorsatum*)	The quills and guard hairs can be used for personal adornment and protection. The meat can be consumed.
Elk (*Aquila chrysaetos, Cervus canadensis nelsoni*)	The antlers are used for soft percussion in lithic tool manufacture and fleshing hides, as well as making saddle frames. The ribs can be used as hide and bark scrapers. The teeth can be used for decorative purposes on clothing. While there are many uses for elk, its meat also is valued.
Bison (*Bison bison bison*)	The hides provide a variety of uses, including clothing, rope, and coverings for wikiups or other structures. The horns make handles for a variety of tools, particularly for knives and other hand tools, and can be carved to make bowls, cups, and spoons. The meat is consumed.

Table 3-438. Common Animals Recovered from Regional Archaeological Sites	
Animal(s)	**Ecological Utility**
Bighorn sheep (*Ovis canadensis*) and mountain goat (*Oreamnos americanus*)	The horns make handles for a variety of tools, particularly for knives and other hand tools, and can be carved to make bowls, cups, and spoons. The meat is consumed.
Eagle (*Haliaeetus leucocephalus*), owl (*Asio flammeus, Asio otus, Athene cunicularia, Bubo virginianus, Glaucidium gnoma, Megascops kennicottii, Otus flammeolus*), and hawk (*Accipiter cooperii, Accipiter striatus, Buteo regalis Buteo jamaicensis, Buteo swainsoni, Circus cyaneus*)	The feathers are used for decorative and ceremonial purposes. The hollow bones can be used as whistles.

Fish

Of expressed primary concern to most southern Columbia Plateau and northern Great Basin groups is access to salmon, stated succinctly by Donald Sampson, former chairman of the CTUIR, when he said that “Salmon are the centerpiece of our culture, religion, spirit, and indeed, our very existence” (CCRH 2016a). Salmon continues to be used in religious services and plays a large role in modern religious practices (CCRH 2016a; Columbia River Inter-Tribal Fish Commission 2014b; CTUIR n.d.c; Confederated Umatilla Journal 2008; Drummond and Steele 2013; Institute for Tribal Environmental Professionals 2007; Quaempts et al. 2007). Like the meat of wildlife animals, fish often was (and is still) dried or smoked and preserved for later use. Beyond various types of salmon, other fish used by southern Columbia Plateau and northern Great Basin groups include steelhead, sturgeon, eel, and trout (CTUIR n.d.c; Fowler 1986:90–91; Quaempts et al. 2007; Ray 1942:104; Steward 1938:42–43, 1943:299; Stewart 1941:370).

Given the delicate nature of their bones and other tissues, the fish taken by southern Columbia Plateau and northern Great Basin peoples appear to serve few functional purposes or technological roles other than those related to food and spirituality. Along the Columbia River, dried salmon was stored in cattail bags lined with salmon skin for preservation (Hunn et al. 1998:540; Moulton 2002).

PRE-CONTACT RESOURCE OVERVIEW

The B2H Project area encompasses portions of the Columbia Plateau and Great Basin cultural areas, each representing expansive geographic areas where various groups of indigenous peoples shared broadly similar social, subsistence, and material culture (Lohse and Sprague 1998). The Columbia Plateau culture area includes all of the area drained by the Columbia and Fraser rivers, with the exception of a portion of the Snake River that drains into the northern Great Basin. The Great Basin culture area, based on shared language, technological similarities, and cultural attributes, is considerably larger, including all areas from the Sierra Nevada and southern Cascade range in the west to the Uintah Mountains and Colorado Plateau in the east and from south-central Oregon, southeastern Idaho, and the western portion of Wyoming in the north to the Mojave Desert in the south (Grayson 2011:11). A comprehensive culture history of the B2H Project area can be found in Aikens et al. (2011),

Andrefsky (2004), Burtchard (1998), d'Azevedo (1986), Grayson (2011), Leonhardy and Rice (1970), and Lohse and Sprague (1998). The discussion below provides a summary of culture chronologies for each region, as informed by previous archaeological research of the area.

Southern Columbia Plateau

Various culture chronologies have been proposed for the Columbia Plateau and its subregions, which are summarized in Map 3-6. This overview is intended only as a general outline and is based largely on Ames et al. (1998), Andrefsky (2004), and Galm et al. (1981), all of which are founded on the culture histories of the region conducted by Butler (1961), Cressman et al. (1960), Daugherty (1956), and Leonhardy and Rice (1970). While subsequent cultural-historical and cultural-ecological models have been used in the B2H Project area and the surrounding areas, including Burtchard (1998), Davis (2001), Dumond and Minor (1983), and Reid (1988), among others, all serve to largely support or refine the initial human temporal-spatial record of the southern Columbia Plateau region of Oregon.

Leonhardy and Rice's (1970) chronology, based on artifact assemblages from several large, well-documented archaeological sites, employed changes in tool assemblages and morphology to define six phases of cultural chronology on the southern Columbia Plateau between roughly 10,000 B.P. and A.D. 1730 in the Lower Snake River region of southeastern Washington. Dumond and Minor (1983) proposed a chronology for north-central Oregon based on the Wildcat Canyon Site and sites in central Oregon.

Importantly, with the proximity of the southern Columbia Plateau to the northern Great Basin culture area, multiple researchers have suggested that a combination of both culture areas commonly is observed in the B2H Project area, particularly during the Late Prehistoric Period (Ames et al. 1998; Cressman 1986). As a result, archaeological assemblages recovered in the southern Columbia Plateau commonly include cultural elements from both regions. For example, Reid (1988) developed a cultural-historical model for the Blue Mountain physiographic province in northeastern Oregon and cited the common occurrence of Elko Series projectile points as an indicator of increased influence from the Great Basin in the southern Columbia Plateau.

Andrefsky (2004) provides a useful synthesis of multiple chronologies to achieve a simplified three-phase sequence for the Plateau, consisting of the Paleoarchaic (prior to 12,000 to ca. 8,250 B.P.), the Archaic (ca. 8,250 to 500 B.P.), and the Late Prehistoric (ca. A.D. 1350 to 1800) periods. Map 3-6 indicates which regional phases discussed above correspond to each of Andrefsky's chronological periods. Andrefsky's chronology is used as the basis for discussion of the Columbia Plateau, as this temporally structured model allows for more effective comparison between the archaeological chronology of the Columbia Plateau and the chronology established for the Great Basin, which is discussed below.

Paleoarchaic Period (prior to 12,000 to ca. 8,250 B.P.)

The Paleoarchaic Period dates from sometime prior to 12,000 and continues to roughly 8,250 B.P. (Ames et al. 1998; Andrefsky 2004). This period represents the earliest archaeological evidence of human occupation in the southern Columbia Plateau. As recently as the late 1990s, this period was

traditionally divided into Period 1A, consisting of Clovis or the Western Fluted Point Tradition, and Period 1B, referring to Post-Clovis or the Western Stemmed Tradition. However, since Ames et al.'s (1998) published culture history, subsequent research conducted at numerous sites throughout the Plateau region and larger Pacific Northwest area has served to question a Clovis-first explanation for the earliest human occupation for the region (Davis 2001; Davis et al. 2012; Jenkins et al. 2012); instead, the Western Stemmed Tradition may represent the earliest documented human groups in the Columbia Plateau in addition to the western U.S. (Beck and Jones 2010). While debate continues to surround the order of these two significantly different technocomplexes, they do overlap temporally during the terminal Pleistocene in the Columbia Plateau, leading some researchers to consider an early co-tradition occupation of the region likely consisting of two distinct ethnolinguistic cultures with different technological organization (Bryan 1988; Davis et al. 2012).

Western Stemmed Tradition sites are common in the southern Columbia Plateau; sites include Lind Coulee, Marmes Rockshelter, Cooper's Ferry, and Hatwai. Hunter-gatherer groups associated with the Western Stemmed Tradition are described as following a broad-spectrum and flexible adaptation to the Pacific Northwest's mosaic environments using a diverse and generalized lithic technological organization (Ames et al. 1998; Bryan 1980, 1988). Western Stemmed Tradition artifact assemblages commonly include formally modified flakes and blades (e.g., unifaces, gravers, and burins), grooved bolas, eyed-bone needles, bone awls, beads, antler wedges, and small milling stones, with the adaptation of dart point and atlatl technologies (Ames et al. 1998). Associated dart point types include Windust (shouldered and stemmed lanceolate shaped) and Cascade (unstemmed foliate or laurel-leaf-shaped) projectile points, among others (Ames et al. 1998). Western Stemmed Tradition sites often are located along the Snake River and its tributaries, the Lower Salmon River in western Idaho, and in the surrounding plateaus and mountainous uplands, including Pilcher Creek in the Blue Mountains (Brauner 1985). Recent excavations at Paisley Caves in south-central Oregon resulted in the recovery of a small Western Stemmed Tradition lithic assemblage associated with an age estimate of 11,340 B.P. (Jenkins et al. 2012). The Cooper's Ferry Site in western Idaho includes an extensive Western Stemmed Tradition component with potential occupation beginning at approximately 11,370 B.P. (Davis 2001).

The archaeological record for the Western Fluted Point Tradition is sparse and generally is viewed as indicative of small, highly mobile groups that focused on exploiting a variety of resources. Artifacts associated with Western Fluted Point Tradition assemblages include formalized bone tools, large bifaces, unifacial tools, and the hallmark fluted bifacial projectile point (e.g., Clovis and Great Basin Fluted) that likely were used as spear points. Western Fluted Point Tradition surface finds are present throughout the region. However, intact Western Fluted Point Tradition deposits have been identified only at the Richey-Roberts Clovis Cache near Wenatchee, Washington. The artifact assemblage from this site is extensive and specialized, likely reflecting ceremonial activities associated with intentional human interment (Ames et al. 1998). The Dietz Site in southern Oregon is an extensive Western Fluted Point Tradition lithic surface assemblage, however, diagnostic Western Stemmed Tradition lithic artifacts also are present (Pinson 2011; Willig 1988).

Archaic Period (ca. 8,250 to 500 B.P.)

The Archaic Period in the southern Columbia Plateau contains three subdivisions: the Early, Middle, and Late Archaic subperiods. The overall Archaic Period generally is characterized by substantial changes in subsistence and material culture. The late Pleistocene/early Holocene transition in the Columbia Plateau is marked by increasingly warmer temperatures and dry conditions following the retreat of continental glaciers, and the resulting shifts in flora and fauna populations correspond with noticeable changes in the southern Columbia Plateau archaeological records (Chatters 1998). The observed transitions in human behavioral patterns—including cultural innovation and technological organization—and similar environmental transformations are apparent in changes observed in the Early, Middle, and Late Archaic material records.

Early Archaic Subperiod (ca. 8,250 to 5,000 B.P.)

The Early Archaic Subperiod of the southern Columbia Plateau dates from roughly 8,250 to 5,000 B.P. (Andrefsky 2004). Projectile point size and configuration indicate a reliance on hunting mammals, although the exploitation of fish and root crops appears to increase over the subperiod, as is evident by the occasional discovery of fishing tackle (Ames et al. 1998), pounding stones, and manos (Andrefsky 2004) at archaeological sites dating from this subperiod. The presence of nonlocal obsidian at Early Archaic sites suggests an increase in either widespread mobility or the development of trade routes, or both (Salo 1985).

Early Archaic sites are found in a variety of geographical settings and include an increased diversity in site function and composition, displaying shifting regional settlement and subsistence patterns during this subperiod. Lithic technological organization, group mobility, residential patterns, and diet-breadth correlate to the newly established Holocene ecosystems in the region. Lithic artifacts recovered at these sites typically include Cascade (foliate or leaf-shaped) projectile points, tabular and keeled end-scrapers, formal and nonformal modified flakes and macroblades, and cobble or pebble tools, including groundstone. Groups during this subperiod practiced a generalized subsistence economy with a broad diet that included the hunting of small and large game, gathering of edible plants, and procurement of riverine resources, such as shellfish (e.g., mussels), salmon, and steelhead. Human burial types from archaeological sites dating from this subperiod were reported to be flexed and extended.

Middle Archaic Subperiod (ca, 5,000 to 2,000 B.P.)

The initial emergence of semi-subterranean pithouses occurs during the Middle Archaic Subperiod (ca. 5,000 to 2,000 B.P.), suggesting a region-wide shift toward semisedentary habitation with a marked decrease in residential mobility (Andrefsky 2004; Chatters 2004; Prentiss et al. 2006). The transition from Early to Middle Archaic on the Columbia Plateau was marked by projectile point morphology and design transition toward relatively smaller projectile points, presumably to be used as dart points (Northern Side-notched, Cold Springs, and Bitterroot Side-notched) to be used with spear and atlatl. Cascade projectile points continue in the early portion of the Middle Archaic, although there is a noticeable decrease in the frequency of projectile points documented from this subperiod in the archaeological record (Ames et al. 1998).

Potential influence or cultural transmission of information originating from the northern Great Basin into the southern Columbia Plateau occurs toward the end of the Middle Archaic Subperiod. Large, side-notched points exhibiting low notches at the base, expanding stems, and short barbs, similar to those attributed to the Great Basin Elko Series, are present in the southern Columbia Plateau, as are projectile points with pronounced shoulders and contracting stems, similar in morphology to Pinto Series projectile points (Lohse 1995).

The Middle Archaic Subperiod is marked additionally by an increasing reliance on seasonal gathering and processing of plants along with the initial establishment of a surplus food economy. Storage pit features are more common at archaeological sites during this time, as is an increase in the diversity—in terms of frequency, type, and, more particularly, size—of grinding and milling stones (e.g., hopper mortar bases, pestles, and anvils) used for seed, plant, and fish processing. Salmon and shellfish exploitation also seems to have gained importance with the establishment of seasonal fisheries, supporting an increased focus on riverine resources as part of an annual round (Lohse and Sammons-Lohse 1986).

Late Archaic Subperiod (ca. 2,000 to 500 B.P.)

The Late Archaic Subperiod of the southern Columbia Plateau dates from roughly 2,000 to 500 B.P. and is markedly distinct from previous cultural periods by the extensive use of pithouses, with a dramatic shift in human land-use patterns throughout the southern Columbia Plateau. Archaeological evidence from this subperiod is indicative of long-term, semipermanent residential sites or villages, special-use camps, an increasing reliance on fishing, especially salmon, along with the exploitation and processing of camas. During the Late Archaic, increased reliance on salmon and camas resulted in the establishment of large, long-term canyon and river terrace residential camps or villages for use during the winter and spring, along with smaller, task-specific upland camps used for summer and fall foraging. This pattern of land use commonly is referred to as the “Winter Village Pattern” (Ames et al. 1998; Andrefsky 2004; Chatters 2004; Endacott 1992).

The Late Archaic Subperiod also is characterized by the appearance of small corner-notched and basal-notched points between 2,500 and 2,100 B.P., which signals the advent of bow and arrow technology (Andrefsky 2004; Chatters 2004). This transition occurred toward the middle of the Late Archaic Subperiod with projectile points becoming smaller and more finely made as the subperiod wanes. Artifact assemblages throughout the subperiod are marked by small end-scrapers, a distinctive concave bit scraper, lanceolate and pentagon-shaped knives, cobble implements, pounding stones, pestles, hopper mortar bases, and net sinkers. Wildlife was hunted, including bison and mountain sheep, along with the all-important salmon.

Domestic architecture during the Late Archaic transitioned from pithouses to the construction of longhouses. Fishing net weights are increasingly common at sites dating from this subperiod, suggesting a refinement in net-making beyond the increasing reliance on anadromous fishing. Basketry and a fiber-and-wood industry also become widespread during the Late Archaic Subperiod. A surplus resource economy is suggested by the common occurrence of storage pit features, which commonly

contained the remains of salmon. Human burials identified from Late Archaic contexts are single flexed interments (Lohse 1995).

Projectile points known from the Middle Archaic Subperiod continue into the Late Archaic and include Hatwai-eared, Rabbit Island Stemmed-like, and larger side-notched point types (Ames et al. 1998). There is an increased occurrence of projectile points similar to northern Great Basin types, particularly Elko Eared and Elko Side-notched types (Ames et al. 1998; Reid 1988). These larger forms gradually are replaced by the smaller corner- and basal-notched forms, including Desert Side-notched-like points (Aikens 1993; Ames et al. 1998). Arrow-like point types tend to dominate Late Archaic sites, a trend that continues into the period of European-American contact.

Late Prehistoric Period (ca. A.D. 1350 to 1800)

The Late Prehistoric Period (ca. A.D. 1350 to 1800) on the southern Columbia Plateau is characterized by Leonhardy and Rice (1970) as the Piqunin (A.D. 1350 to 1700) and Nimipu (A.D. 1700 to historic contact, roughly A.D. 1800) subperiods on the Lower Snake River. The Piqunin Subperiod was developed based on the need for a separate designation for Late Pre-contact archaeological components, including those at the Wexpusnime pithouse settlement (45GA61) in southeastern Washington. Diagnostic artifacts include variable small basal-notched, corner-notched, and side-notched projectile points (Leonhardy and Rice 1970).

Other apparent cultural and material transitions during this time include an increased variation in pithouse size; an increase in larger settlements and villages; the advent of mat lodges; an intensive exploitation of camas and other roots; the development of the ubiquitous practice of fishing and net use; the prevalence of storage facilities, including storage pits and caves; the intensive exploitation of salmon; and the development of food propagation. Basketry, fiber, and wood artifacts also are present, as are small projectile points, suggesting continued use of the bow and arrow (Leonhardy and Rice 1970).

The introduction of the horse by European-American explorers and settlers in the early 1700s typically is considered the beginning of the end of the Late Prehistoric Period and represents the brief Nimipu Subperiod. By the time of contact with European Americans in the early 1800s, the historically documented groups still present today were living in northeast Oregon, including the Cayuse, Umatilla, Walla Walla, Nez Perce, and Paiute Tribes and the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation.

Northern Great Basin

The B2H Project traverses the northwestern corner of the Great Basin culture area, an expansive region encompassing more than 200,000 square miles of western North America between the Sierra Nevada and the Rocky Mountains (Grayson 2011:11). Data produced by several researchers largely have defined the culture history of this area; however, these data are generated entirely from a geographical perspective and do not always explicitly consider the more fluid movement of people and culture between modern regional lines (Grayson 2011:39–40). For this reason, all sites discussed in the northern Great

Basin are well beyond the boundary of the B2H Project area but are discussed because they typify the breadth of northern Great Basin pre-contact adaptation.

A phased chronology presented by Aikens and colleagues (Aikens and Jenkins 1994; Aikens et al. 2011; Jenkins et al. 2004) establishes that cultural change in the northern Great Basin was molded to a significant degree by climatic and ecological events at the regional and subregional levels. The development of a cultural chronological sequence was tied to significant climatic events that affected the human ecology of the region, including unusually hot and cold thermal regimes, flooded marshes, and extended periods of drought. These climatic events prompted cultural responses and patterned lifeways that can be separated into five phases in the archaeological record: Paisley (prior to 12,900 B.P.), Fort Rock (12,900 to 9,000 B.P.), Lunette Lake (9,000 to 6,000 B.P.), Bergen (6,000 to 3,000 B.P.), and Boulder Village (3,000 B.P. to historic contact) periods (Jenkins et al. 2004), which then fall into the Pre-Archaic (ca. 14,500 to 9,000 B.P.), Archaic (ca. 9,000 to 3,000 B.P.), and Late Pre-contact (ca. 600 to 150 B.P.) periods, which are discussed below. Map 3-7 provides a comparison of the various northern Great Basin chronologies. The culture history provided below for the B2H Project area is based on a synthesis of previous culture history research, as well as research conducted at archaeological sites located near the B2H Project area.

Aikens's approach for the northern Great Basin overlaps with many notions proposed by Andrefsky (2004) for the southern Columbia Plateau, although Andrefsky does point out the inadequacies of a Plateau-based chronology for the northern Great Basin, as some characteristics of Great Basin culture (e.g., pottery production, dwelling types and materials, and some lithic technologies) are not specifically Plateau traits.

The Fort Rock Basin, located in Lake County to the west of the B2H Project area, has been the subject of intensive study since the 1940s and has helped established the Fort Rock Basin cultural chronology, as well as the chronology for the northern Great Basin in Oregon. The Fort Rock Basin chronology was developed largely based on work conducted at Fort Rock Cave (Cressman 1942; Cressman and Williams 1940), the Paisley Caves (Bedwell 1970, 1973; Bedwell and Cressman 1971; Cressman 1942; Cressman and Williams 1940), Cougar Mountain Cave (Cowles 1960; Layton 1972a, 1972b), and the Connley Caves (Bedwell 1970, 1973; Cressman 1986). Cressman's work at Fork Rock and the Paisley Caves established the terminal Pleistocene and early Holocene occupations of the region (Cressman 1942; Cressman and Williams 1940); Bedwell (1970, 1973) drew on this research with more intensive investigations. Other south-central Oregon sites, such as the Shepherd Site (Musil 2004), Dietz Site (Fagan 1983, 1984), and Tucker Site (Pinson 2004) also have contributed to development of the regional cultural sequence. Archaeological investigations in the southeastern Oregon area also included work at Catlow and Roaring Springs caves (Cressman 1942; Cressman et al. 1940) and Dirty Shame Rockshelter (Aikens et al. 1977).

Pre-Archaic Period (ca. 14,500 to 9,000 B.P.)

The Pre-Archaic Period (classified as the Paleoarchaic Period in the southern Columbia Plateau) dates from roughly 14,500 to 9,000 B.P. and spans the terminal Pleistocene and most of the early Holocene, which encompass the Paisley and Fort Rock periods (Aikens et al. 2011:49–73; Jenkins et al. 2004:7–

12). While this period throughout North America commonly is associated with the hunting of now-extinct megafauna, including proboscideans, bison, camel, and horse, along with mountain sheep, elk, and deer, much of the evidence of Pre-Archaic activity in the Great Basin comes from areas surrounding Pleistocene lakes and marshes, which currently have little to no definitive evidence of big game hunting. The presence of waterfowl, fish, and small vertebrate remains at and around lake and marsh localities indicates that the occupants of the northern Great Basin had a much broader diet-breadth that relied on more than big game alone, and the occupants continued to use a more generalized subsistence adaptation, which populations likely entered the Great Basin possessing. The environmental setting of the terminal Pleistocene allowed for sustained lakes and marshes in the region with much cooler and wetter conditions than present, although there was a distinct trend toward warming and drying toward the beginning of the Holocene, coupled with the gradual drop of the water table (Beck and Jones 1997; Madsen 2007; Mehringer 1985). Evidence from geoarchaeological research indicates that environmental conditions fluctuated rapidly between wet and dry in relatively small time frames during the terminal Pleistocene/early Holocene transition, coupled with greater seasonality and small but visible lake rebounds (Davis and Schweger 2004:701; Freidel 2001).

The Pre-Archaic Period can roughly be categorized based almost exclusively on changes in distinctive lithic tool technology and associated with direct or relative dating of sites, including pre-Clovis, Clovis, Western Stemmed Tradition, Folsom, and Plano occupations.

While relatively little is known about a possible pre-Clovis occupation of the Great Basin, this notion has seen growing acceptance, although replicable data are currently scarce and a comprehensive picture of cultures dating to this time period has yet to emerge (Adovasio and Page 2003; Dillehay 2000; Fiedel 2014; Yohe and Woods 2002). Pre-Clovis occupation corresponds with occupation of the Aikens's Paisley Period (Aikens et al. 2011; Jenkins et al. 2004); the period's eponym, Paisley 5 Mile Point Caves, is the Great Basin locale commonly believed to hold the best record for such antiquity. Located approximately 300 miles west of the B2H Project area in the Fort Rock Basin area, the Paisley Caves have been noted for their antiquity since Luther Cressman first tested them in the 1940s (Cressman 1942; Cressman and Williams 1940). Work conducted by the University of Oregon since 2002 has provided some of the earliest possible evidence of a pre-Clovis presence in Oregon, including coprolites dated to 14,500 B.P., faunal remains dated to 16,190 B.P., and cultural association with faunal remains from extinct species (Aikens et al. 2011:51; Jenkins et al. 2012); however, debate continues as to the authenticity of the reportedly human coprolites and the cultural modification of animal bones. Independent analyses have determined that the coprolites were either canine (Jenkins et al. 2012: Supplementary Materials pp. 25–27) or herbivore (Poinar et al. 2009; Sistiaga et al. 2014), or they at least do not contain human DNA (Goldberg et al. 2009). Reports of modification of animal bones from the deepest deposits have been abandoned (Fiedel 2014). Regardless of debate, at least 15 radiocarbon and obsidian hydration dates have been published, which are attributed to a pre-Clovis complex (ca. 14,500 to 13,500 B.P.), many of which cluster in a relatively small time frame and follow the law of superposition (Aikens et al. 2011:52:Figure 2.13).

Well-dated Clovis occupations are scant in the Great Basin, with most, if not all, documented Clovis artifacts recovered from surface contexts. Despite this, Clovis occupations generally are believed to date from 13,200 to 12,800 B.P., encompassing the late Paisley Period and transitioning into the Fort Rock Period before the transition to the Holocene Period (Aikens et al. 2011; Beck and Jones 1997; Grayson 2011:289), although Clovis occupations may date to much later in the Intermountain West (Beck and Jones 2010; Bedwell 1973). Clovis toolkits are diverse and consistently exhibit high-quality lithic materials procured from distant sources; at the Dietz Site, located in a small sub-basin of Alkali Basin in southeastern Oregon, discarded and worn-out formal tools were from almost exclusively distant sources, compared with the napping debris on-site, which were obtained from the local Horse Mountain source (Jenkins et al. 2004:11). The archaeological hallmark of the Clovis Period is the Clovis projectile point—a large lanceolate-shaped projectile point with a bifacial basal flute (Justice 2002:67; Yohe and Woods 2002). Although relatively rare in the Snake River Plain, several Clovis-age archaeological sites have been documented, including Jaguar Cave (Plew 2008:34), the Simon Site (Butler 1986:128; Plew 2008:35), Wilson Butte Cave (Gruhn 1961a), Kelvin's Cave (Meatte et al. 1988), the Buhl burial site (Green et al. 1998), and Diversion Dam Cave (Plew 2008:34–40; Rodgers and Yohe 2006), all located in Idaho, as well as the Dietz Site, the Paisley Caves, Sage Hen Gap, the Sheep Mountain Clovis Site, and the Connley Caves of central and southeastern Oregon (Aikens et al. 2011). The Dietz Site provides a definitive Clovis occupation based on more than 60 fluted points and 52 otherwise diagnostic artifacts, although it consists entirely of a wide lithic surface scatter on the shoreline of a pluvial lake. Many of the tools were fluted Clovis points and concentrations of lithic debitage, including flute flakes and broken bifaces (Fagan 1983, 1984; Willig 1988). One possible Clovis point has been identified from a buried context in the northern Great Basin, a point recovered from near the bottom of Connley Cave Number 5 in the 1980s (Bryan 1988), although the authenticity of the point being Clovis is questioned by some, based on the point's morphology and late radiocarbon date of 10,500 B.P. (Musil 2004). While the Clovis assemblages are not well dated in the northern Great Basin, it generally is believed that the end of Clovis is tied with the Younger Dryas climate event, in which near-glacial conditions briefly interrupted the warming trend through the terminal Pleistocene, ushering in the later Folsom complex (Meltzer 2009).

The Western Stemmed Tradition (ca. 13,100 to 8,500 B.P.) also occurred during this period, from the end of the Paisley Period all the way through the Fort Rock Period, and well into the Holocene (Aikens et al. 2011:45; Beck and Jones 1997; Grayson 2011:294). The tradition first was proposed as the Western Pluvial Lakes Tradition by Stephen F. Bedwell in 1970 and is based on his findings at Connley Caves in Fort Rock Basin, which displayed a focus on lakeside settlement with distinctive stemmed (and occasionally concave but nonfluted) terminal Pleistocene and early Holocene lithic technologies (Bedwell 1970, 1973). Subsistence practices focused on marshland resources but also included a variety of terrestrial mammals as well (Jenkins et al. 2004:6, 11). Some researchers view the adaptation as a bridge between the more highly mobile Paleoindian big game hunters of the pre-Clovis, Clovis, and later periods (Pinson 2004:53). Stone tools typical of the tradition include Western Stemmed Tradition, Windust, lanceolate, and foliate projectile points, as well as crescents, large scrapers, bifaces, gravers, scrapers, choppers, cobblestone tools, manos, handstones, and abraders, with bone awls, bone beads,

bone atlatl spurs, basketry, twine, sandals, matting, leather, and various wooden artifacts also present in these assemblages. Evidence of the tradition is inconsistent in Fort Rock Basin (Jenkins et al. 2004:11–16). A small but tightly dated Western Stemmed Tradition lithic assemblage is present at the Paisley Caves, including several stemmed projectile points, from inside a cultural deposit with radiocarbon dates ranging between 13,200 and 12,900 B.P. (Jenkins et al. 2012). While the Dietz Site generally is detailed only in relation to its Clovis complex, a sizable assemblage of at least 31 Western Stemmed points also are present here, most of which are spatially discrete from the Clovis artifacts, suggesting temporally disparate occupations (Willig 1988). Numerous other sites with Western Stemmed assemblages are present throughout the northern Great Basin, many of which contain very diverse assemblages (Jenkins et al. 2004).

Although limited Folsom occupations are present in the northern Great Basin, which date from approximately 12,800 to 11,900 B.P., the occupations encompass the Fort Rock Period and the Younger Dryas climate event, which ends roughly at the beginning of the Holocene epoch (Aikens et al. 2011; Grayson 2011:289; Meltzer 2006:1). Folsom toolkits are highly diverse and display a range of both formal and expedient forms in addition to, like Clovis, showing a preference for high-quality lithic materials from widely distributed sources. Folsom projectile points are similar in form to Clovis points but are generally smaller with fluting that extends along nearly the entire length of the blade. While the overall diversity of mammalian species was reduced during this time, the ranges of certain grassland-adapted species, such as bison, elk, moose, deer, and antelope, expanded and were integral to Folsom subsistence (Yohe and Woods 2002). Folsom occupations are not well represented in the northern Great Basin, particularly in Oregon; currently documented Folsom sites are represented by widespread surface finds (Butler 1972, 1978; Dort and Miller 1977; Guilday 1967; Miller 1982; Ore 1968) and few buried components (Aikens et al. 2011). A Folsom point dating to 12,700 B.P. in association with the remains of mammoth, camel, and an extinct form of bison was recovered at the Wasden Site, approximately 300 miles east of the B2H Project in the eastern Snake River Plain of Idaho. In Oregon several sites have a recorded Folsom Subperiod component, including the Connley Caves, the Paisley Caves, Paulina Lake, and the series of sites known as the Buffalo Flat Bunny Pits sites (Aikens et al. 2011).

Also limited but present in the northern Great Basin is the Plano Tradition, dating to between approximately 11,900 and 9,100 B.P. during the Fort Rock Period of the Fort Rock Basin chronology (Dixon 1999:213–214). In the early Holocene, bison continued to diminish in size but increased in absolute numbers and roamed throughout an expanded range as grasslands proliferated, and Plano groups responded by becoming more highly specialized bison hunters and developing communal hunting techniques (Dixon 1999). Morphological variability is apparent in Plano assemblages, but points continued to be generally large and well made, often from high-quality nonlocal materials, an observation that suggests that groups continued to use large geographic ranges. Lithic assemblages appear as an outgrowth of Folsom industries but with greater morphological and perhaps functional variability. Plano occupations are well represented on the Snake River Plain by surface and subsurface finds, consisting of a variety of unfluted lanceolate projectile points. Plano artifacts have been found in

the northern Great Basin at Haskett (Butler 1965), Wasden (Butler 1965, 1986; Davis et al. 1965; Strawn 1965), Wilson Butte Cave (Gruhn 1961a:118–119), American Falls (Butler 1965; Davis et al. 1965; Strawn 1965), and Redfish Overhang (Sargeant 1973), as well as Scottsbluff, Eden, Angustora, and Plainview localities (Gruhn 1961a, 1961b). In Oregon, Fort Rock Cave, the Paisley Caves, the Connley Caves, Cougar Mountain Cave, Paulina Lake, the Buffalo Flat Bunny Pits sites, and the Locality III Site all include Plano Subperiod components (Aikens et al. 2011).

Archaic Period (ca. 9,000 to 700 B.P.)

The Archaic Period in the northern Great Basin dates from roughly 9,000 to 700 B.P. and, similar to the southern Columbia Plateau, is subdivided into Early, Middle, and Late Archaic subperiods (Simms 2008:62–63). Following the Fort Rock chronology laid out by Aikens and colleagues (Aikens and Jenkins 1994; Aikens et al. 2011; Jenkins et al. 2004), these Archaic periods correlate with the Lunette Lake, Bergen, and Boulder Village periods, respectively. The Early Archaic Subperiod (ca. 9,000 to 6,000 B.P.) occurs from the end of the early Holocene to the beginning of the middle Holocene; the Middle Archaic Subperiod (ca. 6,000 to 3,000 B.P.) occurs during the remainder of the middle Holocene; and the Late Archaic Subperiod (ca. 3,000 to 700 B.P.) occurs during most of the late Holocene (Jenkins et al. 2004).

Early Archaic Subperiod (ca. 9,000 to 6,000 B.P.)

The Early Archaic Subperiod in the northern Great Basin dates from roughly 9,000 to 6,000 B.P. and took place within the Lunette Lake Period of the Fort Rock Basin chronology (Aikens et al. 2011:74–80; Jenkins et al. 2004:12–19). This subperiod marks the transition from the larger stemmed and lanceolate projectile points to smaller Archaic technology and represents changes in subsistence and material culture, although changes in subsistence are less dramatic than during later subperiods (Plew 2008:48). The climate during the early and middle Holocene experienced more extreme variability with cooler and warmer periods than that of present day, and torrential storms likely occurred during the summer months (Simms 2008:77).

Hunting technology during this time is characterized by the manufacture of lanceolate and large corner-notched projectile points developed for use with the atlatl. Early Archaic point styles commonly include Northern Side-notched (Bitterroot) and stemmed-indented base Pinto Series points. With the exception of these innovations, little but a reduced frequency of Early Archaic assemblages and evidence of increased mobility marks this subperiod in the northern Great Basin; more subtle changes include that documented faunal assemblages are nearly entirely waterfowl and small mammals, with few remains of large game in uplands; nondiagnostic lithic tools appear more expedient, particularly with regard to scrapers and groundstone; and hearths are generally small, shallow, and unprepared (Aikens et al. 2011:79).

Early Archaic assemblages in Idaho have been discovered at the Wasden Site (Dort and Miller 1977), Wilson Butte Cave (Gruhn 1961a), the Idaho National Engineering and Environmental Complex (Reed et al. 1986; Ringe 1995), Bison and Veratic rockshelters in the Birch Creek region (Swanson 1972), Weston Canyon in the eastern Snake River Plain (Miller 1972), the Rock Creek Site south of Twin Falls in the central Snake River Plain (Green 1972), and Bachman Cave near Oreana (Metzler 1978),

as well as the Braden Burial Site (Butler 1980; Harten 1980) and the Hetrick Site (Rudolph 1995) near Weiser, Idaho. Notable Early Archaic sites in Oregon include the Locality III Site, the Paisley Caves, the Connly Caves, and Paulina Lake (Aikens et al. 2011).

Middle Archaic Subperiod (ca. 6,000 to 3,000 B.P.)

The Middle Archaic Subperiod dates from ca. 6,000 to 3,000 B.P. in the northern Great Basin and encompasses the Bergen Period as well as the remainder of the middle Holocene (Aikens et al. 2011:80–109; Jenkins et al. 2004:16–19). Climatic conditions during this time are believed to have become more mesic, with wetter and cooler conditions prevailing interspersed with periods of wetter and warmer weather. Conditions were more similar to those at present, with pollen records from the Harney Basin indicating that playas were filled with water and winters were colder than in the Early Archaic Subperiod (Wigand 1987). The climate does not appear to have been static, however. Geomorphic evidence indicates that episodes of sand dune activation and dormancy occurred throughout the Middle Archaic and well into the Late Archaic, suggesting that fluctuations in moisture occurred. Both open and sheltered sites are present in riverine, foothill, and upland settings (Plew 2008:67), and certain localities appear to have been occupied repeatedly by small hunter-gatherer bands.

The hunting technology of the Middle Archaic is characterized by increased variability in projectile point styles that include large side-notched, Humboldt Series concave-base points, Elko Series points, Pinto Series points, and Eastgate Series points. Evidence from the Givens Hot Springs area in southwestern Idaho, near the southern end of the B2H Project, indicates that large semi-subterranean houses were being built by approximately 4,300 B.P. (Green 1982), with the proliferation of constructed houses and large storage pits starting closer to the beginning of the subperiod in the northern Great Basin (Aikens et al. 2011:80). Butler (1978) has noted the appearance of earth ovens during the early part of the Middle Archaic in the Snake River Plain. Hunter-gatherer subsistence strategies continued throughout the Middle Archaic (Gruhn 1961a; Swanson 1972; Swanson et al. 1964), although increased sedentism altered these practices some. While most of the more permanent settlements were located around the rebounded lakes and marshes, many winter camps also are present from this subperiod, suggesting an increased dependence on upland root crops (Aikens et al. 2011). By 3,000 B.P. the archaeological record shows a decrease in projectile point neck widths among artifact assemblages, perhaps suggesting an earlier introduction of the bow and arrow than in other regions (Franzen 1981) or it may simply reflect the use of smaller dart shafts.

Significant Middle Archaic Subperiod sites include the period's eponymous locale, the Bergen Site on the western edge of the Fort Rock Basin (Aikens et al. 2011); Malheur Lake Site, Catlow Cave, and Roaring Springs Cave in the vicinity of Malheur Lake (Aikens et al. 2011); Bobcat Cave (Henrikson 1996, 2003, 2005) and the Wasden Site (Butler 1978) in the eastern Snake River Plain; Rock Creek (Green 1972) and Wilson Butte (Miller 1972) in the central Snake River Plain; and Givens Hot Springs (Green 1993) and Dry Creek (Webster 1978) in the western Snake River Plain.

Although not generally attributed to locales in Oregon, the Western Idaho Archaic Burial Complex, dated roughly 6,000 to 4,000 B.P., has been documented in the Snake River Plain in western Idaho and

likely influenced behaviors in adjacent areas (Pavesic 1985, 2000). Human burial patterns include interments separate from habitations along high sandy knolls overlooking streams, evidence of ritual treatment of the dead, and distinctive special-use artifacts. Human burial goods often incorporate large bifaces, including the distinctive “Turkey Tail” style projectile point, obsidian preforms, and red ochre (Butler 1980; Harten 1980; Plew 2008). One discovery of volcanic tuff pipes included in the human burial assemblage also has been documented (Pavesic 2000). Sites with similar human burials have been found in the Blue Mountains and in the area of the Stockoff Quarry in northeast Oregon, but researchers have not explicitly associated these sites with the burial complex.

Late Archaic Subperiod (ca. 3,000 to 700 B.P.)

The Late Archaic Subperiod in the northern Great Basin dates from 3,000 to 700 B.P. and took place within the Boulder Village Period of the Fort Rock Basin chronology (Aikens et al. 2011:109–141; Jenkins et al. 2004:19–20). This subperiod is characterized by changes in material culture, including the proliferation of the bow and arrow and the adoption of ceramic technology (Plew 2008). Small corner- and side-notched projectile points in the form of Desert Side-notched and Rosegate Series points replaced the larger side-notched and Humboldt Concave-base points of the Middle Archaic Subperiod. The climate during the Late Archaic consisted of near modern-like conditions with modern flora and fauna, but with a much greater amount of variation on either side of the precipitation spectrum (Mehringer 1986; Wigand 1987). During the brief moister intervals, winter months were wetter and summers were cloudier and cooler, allowing for expansion of glaciers and increases in Great Salt Lake and Pyramid Lake water levels. Hunting was still the primary means of subsistence, but strategies changed to incorporate buffalo jumps, game drives, and a heavier reliance on smaller game and fish to support the needs of growing populations. The population of the Snake River Plain expanded during this time of economic diversity and various settlement-subsistence systems developed. Gould and Plew (2001) describe diversifying economic strategies that eventually resulted in some groups refining their subsistence practices and focusing on a single resource, such as salmon fishing.

The archaeological evidence of fish caches and bison jumps for bulk food procurement, accompanied by the employment of diverse subsistence practices focusing on specific resources, suggests that people were becoming more sedentary during the Late Archaic Subperiod. In addition to the changes in material culture and lithic technology, rock images in the form of petroglyphs and pictographs executed in a Shoshone style appear along the Snake River, possibly marking hunting and shamanistic sites (Plew 2008).

Sites from this subperiod identified in Oregon include the interval’s eponymous, Boulder Village, Carlon Village, the Warner Valley sites (including the Warner Valley petroglyphs), Indian Grade Spring, the Dirty Shame Rockshelter Wikiups, the McCoy Creek Site, and the North Ontario Interchange sites. The North Ontario Interchange sites are the closest to the B2H Project area, located at the confluence of the Snake and Malheur rivers near the southern end of the B2H Project. These two sites provide evidence that spawning Chinook salmon and freshwater mussels were collected and roasted there sometime between approximately 3,100 and 2,600 B.P., with minor subsequent visits occurring as late as 1,530 B.P. Artifacts present in the assemblage included obsidian bifaces, a small amount of groundstone,

hammerstones, shell and bone beads, and lithic debitage. Projectile points at the sites are almost exclusively limited to obsidian Elko Series types. Obsidian sourcing studies indicate the tool materials came from the Browns Bench obsidian source in south-central Idaho and northeastern Nevada (Jenkins et al. 2010). The McCoy Creek Site also is closer to the B2H Project, located near Malheur Lake. Excavations at the site have identified superimposed house floors, two hearths, two storage pits, and concentrations of groundstone. Radiocarbon dates place the site between 1,850 and 950 B.P., squarely in the Late Archaic Subperiod (Aikens et al. 2011).

Late Pre-Contact Period (ca. 700 B.P. to 150 B.P.)

The Late Pre-Contact Period is attributed to the time between ca. 700 B.P. and historic contact, which in the northern Great Basin can be ascribed to roughly 150 B.P. Strictly following Aikens's culture history, this period lies at the very end of the Boulder Village Period, although this late period is poorly defined in his chronology (Aikens et al. 2011; Jenkins et al. 2004). The Late Pre-Contact Period is marked by the introduction of ceramics associated with historically known Shoshone speakers and small notched projectile points throughout the Great Basin. Until recently there was general consensus that Numic-speaking peoples arrived in their historic territories relatively recently and that the historic distribution of these peoples was the result of widespread expansion of Numic-speaking populations from lands in southern California (Bettinger and Baumhoff 1982; Butler 1981; Carlyle et al. 2000; Eshelman et al. 2004:69; Kaestle and Smith 2001; Lamb 1958; Madsen and Rhode 1994:3). Currently, there is little consensus regarding when a migration of Numic-speakers occurred, or whether or not a Numic expansion actually occurred, as well as how and why it may have occurred, what the relationship of Numic-speaking populations was to preexisting populations in the northern Great Basin, and how settlement patterns and subsistence strategies differed from pre-Numic populations (Madsen and Rhode 1994). Fairly recent research in Idaho, the central Great Basin, and Colorado shows some Numic-speaking groups (Shoshone and Ute bands specifically) may have emerged from *in situ* Archaic populations (Aikens and Witherspoon 1986; Buckles 1988; Cassells 1997; Holmer 1990; Holmer and Ringe 1986). Numic languages are Uto-Aztecan in origin and are spoken by the Western Shoshone, Northern Shoshone, Bannock, and Northern Paiute tribes associated with the B2H Project area.

The Late Pre-Contact Period is characterized by the increased production of bow and arrow type projectile points, bulk food procurement, expansive material trade, and continued development of ceramic technology. This period is characterized by general warming that occurred after 1,050 B.P., which was accompanied by summer rainfall. Beginning in 950 B.P., decades of severe drought occurred that subsequently were followed by abundant precipitation (Simms 2008:77).

The introduction of ceramics associated with Shoshone speakers and small notched projectile points, such as the Rose Spring, Eastgate, and Desert Side-notched point types, marks the Late Pre-Contact Period (Aikens et al. 2011:47). Hunter-gatherer subsistence strategies continued to be practiced during this time, but the increased number of sites in the archaeological record suggests that population density, as well as the degree of sedentism, continued to increase (Franzen 1981:225). Plant processing became more abundant and widespread (Franzen 1981).

Numerous Late Pre-Contact Period sites have been identified in Oregon, including Boulder Village, Drews Valley, Mortar Riddle, McCoy Creek, Lost Dune, Laurie's Site, Broken Arrow, Indian Grade Spring, the Knoll Site, and Hines (Aikens et al. 2011). Again discussing the McCoy Creek Site near Malheur Lake, a later date of 540 B.P. was documented from a separate house floor, which indicates that the site also was occupied during the Late Pre-Contact Period with a wider variety of projectile points, including Desert Side-notched, Cottonwood Triangular, and small pin-stem corner-notched points similar to those found in the southern Columbia Plateau, associated with the later occupation. The faunal assemblage indicates that site occupants made use of all nearby major habitats, including marsh, lake, stream, and upland environments with a focus also on large game, a pattern that reflects the environmental changes experienced during this time period (Aikens et al. 2011).

Site types that are associated with pre-contact use of the land in the B2H Project area include lithic scatters, camps and habitation areas, quarries, petroglyphs, rock alignments, and cairns.

HISTORIC PERIOD OVERVIEW

Early Historic Contact with Native American tribes

In 1805 members of the Corps of Discovery, led by Captain Meriwether Lewis and Second Lieutenant William Clark, became the first European Americans known to navigate the northwest region by traveling tributaries of the Fraser and Columbia rivers, although Columbia Plateau groups made contact earlier by trading with the British in Alberta, the Spanish in New Mexico, and seafaring traders along the coast (Walker and Sprague 1998:138, 140–141). When word of the region's resources spread, trappers and traders quickly organized to exploit the resources.

Expansion of the fur trade followed closely on the heels of early explorers, with the Hudson's Bay Company and Northwest Fur Companies vying for territory and exploiting otter and beaver pelts as early as 1812 (Idaho State Historical Society [ISHS] 1964; Walker and Sprague 1998:142, 144). Native American tribes traded beaver pelts for domestic goods, weapons, and ammunition (Stern 1998:412). By the mid-1840s, over-trapping had destroyed the beaver populations through much of their natural range in the Columbia Plateau and Great Basin, causing trappers to gradually leave the region (Walker and Sprague 1998:142).

Early interactions between Native American tribes and European-American travelers were peaceful, yet strained. The rapid influx of immigrants in the mid-nineteenth century and the associated depletion of natural resources brought about strife between the European Americans and the Native American tribes. Game and wood resources quickly depleted as Native American tribes were forced to share these resources with European Americans who were migrating westward. Competition for fuel and fodder, along with the damage done to grasslands and water sources by thousands of wagon wheels and traveling pioneers, threatened traditional Native American lifeways, which led to increased dissatisfaction and mistrust between Native American tribes and the pioneers and resulted in armed skirmishes and livestock theft (Ruby and Brown 1972:179). As a result, hostilities between Native American tribes and immigrants increased along with the number of altercations, led by both Native American tribes and the U.S. military cavalry (Sudweeks 1941). In general, however, "thievery and not

murderous attacks constituted the major threat" in these interactions (Unruh 1979:180). It is estimated that between 1840 and 1860, more than 360 immigrants and 425 Native Americans lost their lives in conflict with each other, with most of these deaths occurring west of the Rocky Mountains (Unruh 1979).

Hostilities between Native American tribes and European Americans ran high in the 1850s, spurred by many isolated conflicts; one significant conflict was the incident at the Whitman Mission in 1847. The incident resulted in the deaths of Dr. Whitman, his wife, and 12 others at the Whitman Mission near Walla Walla and arose over frustration and confusion about medical practices used during the measles outbreak of 1847 and 1848, although the rapidly increasing number of immigrants and the decreasing resources also fueled concerns (Oregon Trails Coordinating Council 1998:160; Walker and Sprague 1998:146–148). During the initial conflict, women and children from the mission were taken captive, igniting a large volunteer-supported military war effort and the Cayuse War of 1848 to 1850. The Cayuse War saw many neighboring groups come together in the conflict, including the Palouse, Nez Perce, Umatilla, and Walla Walla, along with the Cayuse (Stern 1998:405). The settler opposition was manned mostly through volunteer groups, many of which came from northern Oregon. The conflict resolution effort used a peace commission and a battalion of 500 volunteers simultaneously; in the end, the mission hostages were released and five Cayuse members were tried, convicted, and hanged for the incident at the Whitman Mission, although controversy followed this legal decision for decades (Oregon Blue Book 2016; Stern 1998:414).

Another incident, involving the Ward party in 1854, was relatively small but had a substantial effect. The brief conflict occurred when the 15-person Ward party camped in the vicinity of Fort Boise along the Oregon Trail; a local Shoshone group attacked the group, believing that they intended to improperly settle there, killing 13 people. The incident led to heightened fears and increased safety concerns for European Americans in the area, inevitably causing the abandonment of Old Fort Boise (which was in a weakened state after flooding in 1853) (Idaho Museum of Natural History n.d.; ISHS 1965; Michno 2003:28–29; Rajtar 1999:93).

Due to the unauthorized settlement of European Americans, agents of the U.S. Government formally surveyed tribal lands for division and sale to immigrants and miners. Oregon Superintendent for Indian Affairs Joel Palmer formulated plans to relocate the tribes to reservations and, along with Washington Territory Governor Isaac Stevens and a military entourage, met with Columbia Plateau tribes in 1855 to negotiate treaties. The Walla Walla, Umatilla, and Cayuse tribes ceded 6.4 million acres (2.6 million hectares) to the U.S., reserving rights on those lands for fishing, hunting, gathering foods and medicines, and pasturing livestock (Treaty between the Cayuse, Umatilla, and Walla Walla Tribes, in Confederation, and the United States 1855). Beyond those acres that were ceded, 510,000 acres (206,390 hectares) were set aside to create the CTUIR. The Yakama and Nez Perce Indian reservations were created at this time as well (Ruby and Brown 1972:189–204; Treaty with the Nez Perce 1855; Treaty with the Yakima 1855).

Little is known about the motivations or events that led up to the multiple attacks on, and subsequent death of most members of, the Utter-Van Ornum train party, who were traveling from Wisconsin to

Oregon's Willamette Valley along the Southern Alternate Route of the Oregon Trail. The 44-person migrant party, consisting of 4 young families and 13 single men, of which 5 were recently discharged soldiers and 1 was an Army deserter, was attacked on September 9 and 10, 1860 near Castle Creek, Idaho, by an estimated 100 men of an unknown group (although they have since been presumed to be Bannock and Shoshone) (Allen 2005; Idaho Chapter OCTA 2016; Madsen 1985:116). This initial skirmish left 11 members of the Utter-Van Ornum party and approximately 25 Native Americans dead; after multiple attacks to the wagon party over the two days, the remaining members of the party escaped on foot with few resources, having abandoned their wagons, starving oxen, and what was left of their cattle. While accounts vary slightly, the remains of the Utter-Van Ornum party met with Native American groups several additional times (including a few occasions to trade) while they made their way up the west side of the Snake River in hope of encountering a rescue party. Most of those left after the attacks died from starvation, with accounts detailing that, "after much discussion and prayer," those individuals were cannibalized in hopes of eventually finding rescue (Idaho Chapter OCTA 2016). Additional hardship befelled the group, as it was reported that at least four children had been taken captive by their attackers (ISHS 1993:9, 31–32). After a month and a half and more than 75 miles from which the conflict started, 12 immigrants were rescued by a military group near the confluence of the Snake and Owyhee rivers; this event became known as the Utter-Van Ornum Disaster (Allen 2005; Idaho Chapter OCTA 2016; ISHS 1993:1–2; Madsen 1985).

The events associated with the Snake War of 1864 through 1868 are not defined by one, or even several, battles but by a drawn-out series of generally small conflicts and raids between the "Snake" groups and the European Americans across Idaho, Oregon, Nevada, Utah, and California. The broad groups referred to as the "Snake" groups consist of those living in proximity to the Snake River, including members of the Bannock, Shoshone, and Northern Paiute tribes. Frustrations mounted among the Snake groups as the numbers of European-American immigrants surged in the late 1850s, with more and more people settling on the groups' traditional lands, particularly after the California gold rush began to subside and people began to look for opportunities elsewhere. Of particular nuisance to Native American tribes were prospectors and freighters, who consumed large quantities of natural resources and increased traffic on already well-worn trails and water systems. Small parties of Snake members had sporadic raids that were geared toward disrupting the flow of goods and resources, and the settlers responded by organizing various volunteer troops to try and combat these actions. The settlers' attempts to suppress these disruptions were largely unsuccessful and local businessmen called on the War Department to mobilize against the incursions. Several military camps were created or restructured (Camp Lyon, Camp Alvord, Camp Reed, Camp Lander, Camp Warner, Camp Three Forks, and Camp C.F. Smith, among others) and Fort Boise received new soldiers (many of whom were transferred directly after the end of the Civil War) and was restructured to house the First Oregon Calvary. Although there were small successes by these increased military powers, what changed the direction of the war was the appointment of Lieutenant Colonel George Crook to Fort Boise. While Crook was a known, formidable military man, his methods also included negotiating with Snake leadership, particularly Chief Wewawewa of the Northern Paiute; by September of 1868, a conclusion had been reached (ISHS 1966, n.d.; Michno 2007). The Snake War stands as the deadliest individual

conflict between Native American tribes and European Americans, with an estimated 1,762 people killed, wounded, or captured (Michno 2007:345–346).

The Shoshone-Bannock Tribes of the Fort Hall Indian Reservation were parties to numerous unratified and ratified treaty rights in their history, with the treaties of the "Great Peace Commission" signed between 1867 and 1868 standing as the last ratified by Congress. On June 14, 1867, President Andrew Johnson approved an executive order to define the Fort Hall Indian Reservation, an order that was followed by the *Treaty of Fort Bridger of 1868* (Treaty with the Eastern Band Shoshoni and Bannock 1868). On July 3, 1868, the Indian Peace Commission sent General Christopher C. Augur to negotiate a treaty with the Snake and Bannock tribes, as well as the Eastern Shoshone under their leader Washakie (Treaty with the Eastern Band Shoshoni and Bannock 1868). The treaty negotiations established the Wind River Reservation for the Eastern Shoshone with a clause that whenever the Bannocks "desire a reservation to be set apart for their use, or whenever the President of the United States shall deem it advisable for them to be put on a reservation, he shall cause a suitable one to be selected for them in their present country, which shall embrace reasonable portions of the 'PortNeuf' and 'Kansas Prairie' countries, and that, when this reservation is declared, the United States will secure to the Bannocks the same rights and privileges therein" (Sanger 1869:674). The designation of Kansas Prairie in the treaty language was made in error and should have instead stated "Camas Prairie," a seemingly minor inaccuracy that led to the Bannock War of 1878.

The Bannock War of 1878 erupted when settlers living near Camas Prairie in south-central Idaho allowed their livestock to disturb wet meadows full of camas, a primary food source for Native Americans. Furious at the destruction of such an important resource, members of the Shoshone-Bannock threatened settlers. One such incident escalated on May 30, 1878, when two settlers were shot and wounded by a group of Bannock in Big Camas Prairie. Led by Chief Buffalo Horn and joined by Umatilla and Paiute members, the group went on the run. Government volunteer troops were mobilized out of Fort Boise and they pursued the Native Americans through southern Idaho to a small mining camp near South Mountain, where Chief Buffalo Horn was mortally wounded. Traveling west into Oregon, the Native American group, also now joined by Malheur Paiute and Cayuse members, continued to raid small settlements, burned a wagon train, and sank Glenn's Ferry all while encountering various Army and volunteer militia parties in other skirmishes. On July 8, 1878, two Army units of approximately 700 men met and cornered the Native American group on Pilot Rock, above Birch Creek. The last remaining members of the Bannock-led group were rounded up in Yellowstone Park (ISHS 1969; Michno 2003:317–321). Those who participated in the Bannock War, among others, were forcibly relocated to Fort Hall (Shoshone-Bannock Tribes of the Fort Hall Indian Reservation 2015).

Essentially all of the B2H Project area in southwestern Idaho and eastern Oregon was contested land during the turmoil of the 1860s, 1870s, and 1880s. Because of increasing hostilities between Native American tribes and settlers, the U.S. Government ordered that all Native Americans in surrounding regions be gathered up by the U.S. Calvary and held forcibly following the end of the Bannock War. Over the winter of 1878 to 1879, approximately 550 Paiute and Bannock people were ordered to walk

250 miles under armed guard from Fort Harney to Fort Simcoe, Washington, where they would be held on the Yakama Reservation. Known as the Forced March of 1879, many did not survive this experience (Michno 2003; Winnemucca 1883:137–202). While both Paiute chronicler Sarah Winnemucca Hopkins and U.S. Indian Agent W.V. Rinehart indicate that the general route taken by the captives trended north-south from Fort Harney to Fort Simcoe after people were gathered from the Boise and Weiser areas, government-to-government consultation with the Shoshone-Paiute Tribes indicates that the Oregon Trail through the B2H Project area was a part of the route that their people traveled during the forced march. Although formal studies to identify segments of trail associated with this event have not been undertaken, the possibility that previously identified and unidentified trail segments are located in the B2H Project area should not be discounted. The Forced March of 1879 is still remembered by the Paiute, who consider lands within the B2H Project area sacred to their culture.

Cultural resources that could be encountered in the B2H Project area that reflect this early period of contact between Native American tribes and European Americans include trapping and hunting camps, Native American habitation sites, hunting sites, artifact scatters, cairns, rock alignments, early homesteads, marked and unmarked graves, military forts, and Native American and immigrant trails.

Transportation

Roads and Trails

Indian Trails

Before the westward migration of European Americans, Native American tribes had established networks of trails to facilitate trade and regional travel. Commodities such as marine shells, obsidian, camas, and salmon were carried many miles from their origins across these networks. Established trails had a pronounced effect on the way early European Americans used the area; explorers were led by Native American guides along the trails, traders built their posts beside the trails, and battles were fought near the trails. Many immigrant trails were developed directly from Indian trails, although wagon use sometimes necessitated modification to routes (Blakeslee 1988). The route that would become the Oregon Trail comprised mostly segments of hunting and migration trails actively used by Native American tribes well into the nineteenth century.

Immigrant Trails

Early explorers incorporated segments of Native American trails into those trails that could be accessible by wagon. In 1812 fur traders made an arduous 10-month journey from St. Louis, Missouri, to Fort Astoria, Oregon, along existing trails and natural travel corridors, much of which would become the Oregon Trail (Dary 2004). Later groups of traders and trappers found an alternative route through South Pass, Wyoming, that made it possible for wagons to travel the trail (BLM 1986). Numerous wagon roads are depicted on historical maps that cross the study corridor in multiple locations.

Several roads and trails are of significance to the history of the area and are either listed, or have been determined eligible for listing, in the NRHP. Related to roads and trails, the Poison Creek Stage Station is located within the study corridor in Idaho. The station contains a house, a barn, two root cellars, a

schoolhouse, a chicken coop, and an outhouse. This property was constructed in 1886 as a way station for the Jordan Valley-Caldwell stage line and was listed in the NRHP in 1978 (Hibbard 1977a).

A modern road through the study corridor that was started as an early immigrant trail is U.S. Highway 95 (U.S. 95). The north-south path that U.S. 95 travels through much of the interior west was used by freighters and miners and as a stagecoach line. The first iteration of U.S. 95 dates back to 1925, at the inception of the highway numbering system, and was entirely in Idaho (Federal Highway Administration [FHWA] 2015a). There were many segments of U.S. 95 in Oregon, but they remained difficult to navigate by automobile at this time, until the path was championed by local resident Dr. Walter William Jones. In 1944 the route was paved and was designated the Idaho-Oregon-Nevada Highway, or the ION Highway, as it by now traversed all three states (Hanley and Lucia 1973:270). To this day, U.S. 95 remains an important alignment through the western U.S. because no other reliable route runs north-south in this portion of the country, connecting Canada to Mexico.

Several named roads, which were likely based on early trails and wagon roads, are located in the B2H Project area. These include the Butler Creek Trail, Ontario to Burns Freight Road, Road from Baker City to Sparta, Road to Silver City, Uniontown Road, Quartz Mill Road, Sparta Road, Road from Walla Walla to Boise, and the Road from Baker to Boise.

Oregon Trail

The network of pathways that became known as the Oregon Trail is actually a series of trail segments, river crossings, and landmarks that stretch across 1,932 miles (3,109 kilometers) to link the western frontier with the settled lands of the east (Lissandrello 1976). Many components of this historic trail have been designated congressionally as NHTs and are part of the National Trails System. Interconnected with this transcontinental trail are regional and local historical stage and freight roads.

The principal route of western migration across southern Idaho into Oregon was the Oregon Trail. Originally established by Native American tribes, the route was refined by early European-American explorers and fur trappers, including members of the Astor Expedition of 1811 to 1812, and by Captain John C. Frémont in 1843. The first wave of migration came during the 1830s, as Protestant missionaries journeyed west to convert Native American populations (Hutchinson and Jones 1993). The first true immigrant wagon train arrived in southeastern Idaho in 1841, consisting of the Bidwell-Bartleson party. Thirty-four members of the Bidwell-Bartleson party and accompanying missionaries continued west along what would become the Oregon Trail. Shortly after the Bidwell-Bartleson party, Captain Frémont explored the region as part of a federal expedition and published accounts that later became the trail guides for subsequent immigrants along the Oregon Trail (Hutchinson and Jones 1993). By the mid-1840s, the Oregon Trail was a major nationally recognized thoroughfare for immigrants making their way west.

Portions of the Oregon Trail were used into the late 1890s, but the trail saw a decline once the Transcontinental Railroad—which provided faster, safer, and, usually, cheaper travel—was completed in 1869. One way that the Oregon Trail remained relevant in the days of the railroad were through the expansion of stage stops, which afforded the more flexible option for horse teams to be either

exchanged or rested. One such important locale in the B2H Project area is the Slough House Stage Station [Stop] near Baker City. Built in 1865, the stage stop was located near the Oregon Trail at the intersection of the Road to Auburn (along the same alignment as I-84) and the Baldock Slough. The Slough House Stage Station [Stop] briefly was rivaled by another stop, the Ward Slough House, less than one mile to the north. The Ward Slough House predated the Slough House Stage Station [Stop] by at least one year, with its only documentation located on an 1864 surveyor's map. The Slough House Stage Station [Stop] ceased to be a stage stop by 1910 and was torn down in the late 1930s (Dielman 1999). Another landmark in the Baldock Slough vicinity was the Lone Tree (also referred to as Lone Pine), an infamous, solitary, and large pine tree along the Oregon Trail in Baker Valley. The tree was documented in numerous diaries and records of immigrants' journeys along the trail and served as an easy location to briefly rest and water animals in the slough before ascending the daunting Blue Mountains. Before the Lone Tree was chopped down for firewood on September 28, 1843, the Baldock Slough sometimes was referred to as the Lone Tree Creek in immigrant diaries. Long after the tree was cut down and burned for fuel, knowledge of it persisted with those along the Oregon Trail; in the last decade, several monuments and interpretive signs have been placed in dedication to the Lone Tree, which was likely located about 6 miles northeast of Baker City, where the Oregon Trail crossed the Powder River (Dielman 2013).

Many of the well-traveled segments of the Oregon Trail were converted to facilitate modern highways and railroad segments, including several segments of the Old Oregon Trail Highway, U.S. 30, and I-84, which all share similar alignments through Idaho and Oregon. The time-tested route of the Oregon Trail was first adapted for the Old Oregon Trail Highway, a system "which leads the tourists of today through a fertile expanse of wheat fields, orchards and fruit lands, grazing country for thousands of cattle, unexcelled mountain scenery, the vast rolling hills bordering the Snake River, the wonderland of the Columbia River Highway, and on to the sea" (Parker 1923:4). The Old Oregon Trail Highway, also more simply known as the Old Oregon Trail, was constructed in the 1920s. The opening ceremony was attended by President Harding when the highway opened on July 3, 1923 (Hartmans et al. 2001:8[9]). As originally defined, the Old Oregon Trail was only present in Oregon, extending from the Idaho state line to Pendleton, after which the alignment of the Oregon Trail became the Columbia River Highway (Parker 1923:4).

In 1925, state and federal highway officials on the Joint Board on Interstate Highways discussed the future of U.S. 30; one of the several proposed routes for U.S. 30 included extending the route roughly along the alignment of the Old Oregon Trail. While a proposed route through Salt Lake City, Utah, prior to entering Oregon and continuing to the Pacific Ocean was contested (the Lincoln Highway Association advocated for Salt Lake City as it was more similar to their flagship highway), the route, as it was constructed in 1926 through southern Idaho, more closely follows the original Oregon Trail (FHWA 2015b). U.S. 30 travels on the north side of the Snake River from Boise through Fruitland, crosses the Snake River and extends into Oregon, and proceeds roughly north-northwest all the way to Boardman, with many long stretches present in the study corridor.

The most recent iteration of this alignment is the discontinuous western segment of I-84. The alignment, as it currently stands, was first constructed in 1956 as the northern fork of Interstate 80 (I-80N) to serve the Pacific Northwest. The name was changed to I-84 in 1980 after a measure discouraged the use of directional markers in interstate names. I-84 follows an almost identical alignment to U.S. 30, save for diverting for Fruitland and New Plymouth, Idaho, and skirting around Baker City, La Grande, and Pendleton, Oregon, and no longer going through their downtown business centers (Hartmans et al. 2001:8[11]); Utah Department of Transportation [UDOT] 2008). In Idaho and Oregon, I-84 also is known as The Vietnam Veterans Memorial Highway (Legislature of the State of Idaho 2014; Oregon Legislative Assembly 2013).

Numerous markers and memorials have been erected at burial sites, springs, immigrant camps, and inscription sites along these areas of the Oregon Trail. Several segments have been given discrete names, such as the California Gulch/Blue Mountain, Whiskey Creek, White Swan, Virtue Flat, Straw Ranch 1 and 2, Swayze Creek, Birch Creek, Tub Mountain, and Alkali Springs segments.

Note that the Oregon Trail will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Oregon NHT.

Upper Columbia River Route

The Upper Columbia River Route was one of the earlier, well-worn segments of the Oregon Trail, traveled most heavily between 1841 and 1851. The path of the Upper Columbia River Route floated immigrants from the Hudson's Bay Company's Fort Nez Perce near Walla Walla, Washington, down the Columbia River to The Dalles. This route was traveled by the many parties who stopped at either the fort or the nearby Whitman Mission for supplies, rest, or medical assistance. This portion of the Columbia River was first traveled by Lewis and Clark with the Corps of Discovery in 1805, and then it was used regularly between Hudson Bay Company forts beginning in 1818 and then by missionaries in the 1830s. In 1836 Methodist missionaries Dr. Marcus and Narcissa Whitman traveled west via caravan, establishing several missions along the way before settling the Whitman Mission near present-day Walla Walla. The shore along the Columbia River also was walked, where the dangers of water passage were replaced by exhaustion in navigating the steep and rocky shoreline. As more routes were created across the Oregon Trail landscape, the Upper Columbia River Route saw decreasing use, although the Columbia was still floated along other segments of the river (NPS 2015; Oregon Trails Coordinating Council 1998:167–176).

Note that the Upper Columbia River Route will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Upper Columbia River Route Study Trail.

Umatilla River Route and Columbia River to The Dalles

Beginning in 1844, immigrants along the Oregon Trail began to shorten their route by circumventing the Whitman Mission and entering the Columbia River from the Umatilla, saving several days of travel by using this new Umatilla River Route and Columbia River to The Dalles. After the incident at the Whitman Mission in 1847, the mission was closed entirely and many more immigrants took this shorter route. The Umatilla River Route and Columbia River to The Dalles breaks away from the Oregon Trail at Echo, Oregon, where the trail ordinarily crossed the Umatilla River. From here, travelers would float

the river to its junction with the Columbia River and proceed along the Upper Columbia River Route, either by land or by water (NPS 2015; Oregon Trails Coordinating Council 1998:176–178).

Note that the Umatilla River Route and Columbia River to The Dalles will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Umatilla River Route and Columbia River to The Dalles Study Trail.

Meek Cutoff

The Meek Cutoff was blazed as an alternate, fractured route of the Oregon Trail in 1845 which traveled west from the Oregon Trail's junction with the Malheur River in Vale. Stephen Meek, accompanied by approximately 1,000 immigrants, 200 wagons, and 4,000 heads of livestock, set out convinced that they could connect an overland route through central Oregon and into the Willamette Valley, saving roughly 150 miles (241.4 kilometers) of travel and avoiding potential conflict with Native American groups. Meek led the wagon train along the rocky banks of the Malheur River and over steep rocky bluffs, with the wagons and immigrants experiencing a difficult time along the route (Beckham 1991; Clark and Tiller 1966; Jackman and Scharff 1996:18; Lang 2016).

Water and forage for draft animals became scarce along the journey and many of the immigrants felt that Meek had misled them. Emotions reached a fever pitch when the group became stalled at Lost Hollow, with no water found within miles (Clark and Tiller 1966:48; Montgomery 1992:260). The wagon train split just south of the Maury Mountains near Lost Hollow, with one small group traveling northwest in search of the Deschutes River and the other larger group traveling more north toward the Crooked River. The two groups arrived separately at Sagebrush Springs, near Gateway, Oregon. Meek and the remaining immigrants reached The Dalles, having lost at least 23 members to disease and hunger along the way, with an estimated 25 more people dying after reaching The Dalles (Clark and Tiller 1966:62–119; Oregon Trails Coordinating Council 1998:199–213). Slight variations along this route are present, exemplified in two of the three routes undergoing analysis in the Four Trails Feasibility Study (NPS 2015). The two routes relevant to the study corridor are the Ragen and Hambleton routes (Hambleton and Hambleton 2014; Ragen 2013). For further information regarding these routes (Ragen and Hambleton), refer to Section 3.2.15.

Note that the Meek Cutoff will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Meek Cutoff Study Trail.

Goodale's Cutoff

Goodale's Cutoff is a 230-mile (370.1 kilometer) spur that began as a Native American trail and briefly was used as an alternate route to the Oregon NHT as early as 1820 by Donald Mackenzie in search of a trail for Canadian fur hunters to use (ISHS 1994, 1995). The main segment of the cutoff trail left the Oregon NHT at Fort Hall, Idaho, traveled northwest, then continued west near the modern alignment of U.S. Route 20 and through Camas Prairie, and rejoined the Oregon NHT between Mountain Home and Boise (ISHS 1972; McGill 2006a; NPS 2015, n.d.a). Widespread use of the cutoff dates to 1862, when a party of more than 1,000 immigrants hired guide Tim Goodale to lead them from Fort Hall to Fort Boise. Goodale's Cutoff Study Trail quickly rose in popularity because it served to avoid military conflicts with the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, offered relatively

unexploited grazing resources, and took settlers close or directly to the sites of several small gold rushes, including Salmon River and Boise Basin (Dary 2004; ISHS 1995; Wells 1972). The area's topography and volcanism caused those who took the cutoff to face many difficulties, including repeatedly needing to construct trail segments as they went along and coordinating with other local businessmen, including John Brownlee and other ferrymen along the Snake River (ISHS 1972, 1994).

An additional small northern segment, Goodale's Boise-North Route was newly blazed by Goodale. The route began west of Boise Basin and proceeded north to the Brownlee Ferry crossing of the Snake River then followed a westward alignment to Richland, crossed the Powder River, followed a southern alignment, and continued along the creek to Flagstaff Hill near Baker City, Oregon (ISHS 1972, 1994; McGill 2006b; NPS 2015). This generally "zigzag road," traversing the steep inclines of several the river banks, was an alternative purportedly used by prospectors, including prospector George Grimes, who used the route to travel between the Boise Basin mines and Walla Walla (McGill 2006c; Wells 1972). By 1864 guides were no longer necessary through the land surrounding the cutoff because the area had become so well developed (ISHS 1972; 1994; NPS n.d.a).

Note that Goodale's Cutoff will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Goodale's Cutoff Study Trail.

Olds Ferry Road

One relatively small connecting trail is the Olds Ferry Road, which was created for the express purpose of bringing immigrants to the Olds Ferry. The Olds Ferry Road begins along Goodale's Boise-North Route alternate along the Payette River, southeast of Weiser, Idaho along the Snake River. The trail proceeds through what is today Weiser, turns and makes a straight path northwest for Eaton, Idaho, and then follows closely along the north bank of the Snake River to Farewell Bend, the location of Olds Ferry. The main route of the Oregon Trail is located immediately on the Oregon side of the Snake River in this location (NPS 2015). Olds Ferry began operation in 1863 and was operated by Ruben Olds under the Oregon Road, Bridge, and Ferry Company. The ferry and the trail remained operational at this location until 1920 when the ferry was purchased and moved down the river to Brownlee (ISHS 1982a, 1982b; Query 2008:40).

Note that the Olds Ferry Road will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Olds Ferry Road Study Trail.

The Dalles-Boise Military Road

After the regional discovery of gold in 1861, the road from The Dalles to Canyon City became a major transportation route for people and supplies on route to the gold fields. A parallel road, using much the same route as The Dalles to Canyon City, was surveyed between 1864 and 1867 by Major Enoch Steen and was established as the Dalles-Boise Military Road in 1867, under the federal government's interest in allocating land grant wagon roads (NPS 2002; Preston 1972). The road traveled east from Canyon City, Oregon, to Idaho, linked The Dalles to Fort Boise, and crossed the Oregon Trail near Malheur River, south of Farewell Bend.

Lewis and Clark Trail

Although not a traditional immigrant trail, the Lewis and Clark Trail is studied as a cultural resource. The approximately 3,700-mile-long Lewis and Clark Trail was designated to commemorate the route of the Corps of Discovery from Wood River, Illinois, to the mouth of the Columbia River, near what is now Astoria, Oregon (from 1804 to 1806). The trail largely follows the Missouri, Yellowstone, and Columbia rivers (NPS n.d.b). The segments of the Lewis and Clark Trail adjacent to the B2H Project follow the Columbia River for both the outbound and return route of the expedition.

Note that the Lewis and Clark Trail will be referred to in Sections 3.2.13.1 and 3.2.13.6 as the Lewis and Clark NHT.

Railroads

In 1879 Henry Villard became a major force in Oregon railroading when he purchased the Oregon Steam Navigation Company and the Oregon Steamship Company, merged the companies with his interests in the Oregon and California Railroad, and created the Oregon Railway and Navigation Company (OR&N). That same year, the Union Pacific Railroad and Villard agreed to connect the rails of the OR&N with the rails of the Union Pacific transcontinental mainline at Granger, Wyoming, to create a direct line to the Pacific coast. In 1881 the Union Pacific incorporated the Oregon Short Line (OSL) to develop a connecting line from Granger, Wyoming, to Baker City, Oregon, where the OR&N was extending its own line. The OR&N reached Pendleton, Oregon, on August 31, 1882, and Baker City, Oregon, in August of 1884. The final spike connecting the two railroads was driven at Huntington, Oregon, on November 25, 1884. Along this new line, La Grande was appointed the location of a new diversion point, creating a new hub of industry and population in northern Oregon (Hartmans et al. 2001:8[3]). The OSL acquired control of the OR&N in 1887, thus giving the Union Pacific a through route to the Pacific Ocean. The OR&N lines were leased to the Union Pacific's OSL starting in 1887 until the Union Pacific purchased a controlling stock of the OR&N in 1889 (Deumling 1972; Strack 2014).

In 1893, following a national economic panic, the Union Pacific was forced into bankruptcy along with its subsidiary railroad companies. In July 1894, the OR&N regained control of its own operations and was appointed its own receiver. In 1896 the Oregon Railroad and Navigation Company (ORR&N) was incorporated and quickly purchased the OR&N along with its subsidiary and leased companies, whose stock was mostly owned by the OSL (Strack 2014). The Union Pacific, now under new management, was left with a transcontinental railroad that ended at the Great Salt Lake, where it connected with other railroads. The OSL emerged from bankruptcy in 1897 as an independent company and remained so until 1899 when it was again leased by the Union Pacific (Robertson 1995:219). By the end of 1899, through settlements and directorial changes, the ORR&N was a subsidiary of the Union Pacific (Strack 2014).

In the early 1900s, the Union Pacific constructed new lines and gained additional operating agreements. On May 12, 1906, the Oregon-Washington Railroad and Navigation Company was incorporated in Oregon to build a line between Portland and Seattle. On December 23, 1910, the Oregon-Washington Railroad and Navigation Company acquired all the assets, liabilities, and

operations of the smaller sister companies, including the ORR&N; the Oregon Eastern Railway; the Oregon and Washington Railroad; the Oregon, Washington, and Idaho Railroad; the Boise and Western Railway; the Columbia River and Oregon Central Railroad; the Idaho Northern Railroad; the Wallula to Yakima; and the Umatilla Central Railroad (Strack 2014).

Construction of a branch line from Ontario to Burns, Oregon, was started in 1913 and completed by 1925. From the 1930s through the 1960s, the Oregon-Washington Railroad and Navigation Company main line was rebuilt to accommodate the various dam projects constructed on the Snake and Columbia rivers. Over time, the Oregon-Washington Railroad and Navigation Company name fell into disuse as most people identified the railways with the Union Pacific, largely due to the fact that the diesel locomotives were labeled and painted with the Union Pacific colors and emblems (Laubaugh 2012).

Logging Railroads

On June 30, 1890, the independent Sumpter Valley Railroad was incorporated in Oregon by David Eccles and four partners to haul logs to a new sawmill that was being built for the Oregon Lumber Company in South Baker City. Work began immediately to lay track from South Baker to the timberlands along Sumpter Valley. The railroad began offering passenger and freight service in 1892 to McEwen in addition to hauling logs to the Oregon Lumber Company mill (Robertson 1995:146–147). By the 1920s, the railroad began to lose passenger and freight business to automobiles and trucks. The railroad ceased operation in 1947 (Robertson 1995:146–147).

The Mount Emily Lumber Company was founded in 1924 under the parent company the A.H. Strange Lumber Company, which was founded in 1911. Forty miles (64.4 kilometers) of railroad line in the La Grande area were constructed to connect with the Union Pacific mainline 8 miles (12.9 kilometers) west of town. The Mount Emily Lumber Company purchased the Grande Ronde Lumber Company in 1925, particularly for its railroad line to access a saw mill in La Grande. The company largely switched from rail logging to truck logging in 1930, but the Mount Emily railroad mainline continued in use until 1955 (High Desert Rails n.d.).

Energy Exploration/Resource Extraction

Mining

Gold Mining

The majority of gold mining operations in Idaho's Owyhee County were located in the Silver City mining district in the northwestern part of the county, with placer mining operations conducted along the Snake River. The broad Silver City area is more or less the only locale in Owyhee County that is suited geologically to contain mineral resources (Asher 1968:3). The Silver City mining district included the De Lamar, Flint, and Florida Mountain-War Eagle Mountain camps in northwestern Owyhee County. Between 1863 and 1865, more than 250 mines operated in the district, beginning with Discovery Bar along Jordan Creek near De Lamar. Claims in the area were staked very quickly and, with the ore disproportionally located toward the surface, fortunes were made and lost quickly. Many wars, which were more accurately hotly contested arguments, were waged over disputes of claim locations and

resources and were caused largely by the reckless management of the land (Asher 1968:11–12). By the early 1870s, when the rich oxidized ore deposits were nearly exhausted, the district had produced $12.5 million in gold and silver (Asher 1968:10; Koschmann and Bergendahl 1968:138; Piper and Lacey 1926).

The second wave of mining in the Silver City area began in 1889, following gold discoveries at the Black Jack Mine on Florida Mountain and the De Lamar Mine at Wagontown. This boom proved to be larger in scale than the first; by 1914 when the second boom ended, the district had produced $23 million in precious metals before the ore resources were exhausted (Koschmann and Bergendahl 1968:138; Piper and Lacey 1926). A third wave of mining in Silver City occurred in the 1930s, when the price of gold made the milling of old dumps profitable. However, significant interest never took off and operations terminated in 1942 (Asher 1968:10). The Silver City Historic District was added to the NRHP in 1972 (Wells 1971). Currently, no major mines are operating in the district.

Of note is the NRHP-listed Bernard's Ferry that provided an important transportation link between the communities of Nampa and Caldwell and the mines at Silver City. The ferry, established in 1882 by J. C. Bernard, was in operation until 1920, when construction of a bridge ended the need for river transportation. The remaining barn and associated structures were listed in the NRHP in 1978 (Hibbard 1977b).

Roughly 75 percent of Oregon's gold production occurred in the Blue Mountains, in a region referred to as the "Gold Belt of the Blue Mountains" (Brooks and Ramp 1968:41). The belt is approximately 50 miles (80 kilometers) wide by 100 miles (160 kilometers) long and extends from the John Day River in the west to the Snake River in the east. Of particular relevance to the B2H Project area, because of their proximity, are the Lower Burnt Valley, Sparta, and Virtue mining districts.

The Lower Burnt River Valley District, which includes the former Gold Hill District (Gilluly et al. 1933:54) and the Weatherby, Gold Hill, Durkee, Chicken Creek, and Pleasant Valley areas, is located north of Huntington along the Burnt River in southern Baker County. Placer mines in this district were worked in the early 1860s, followed by lode mines in the 1880s. Gold was readily available in Burnt River tributary streams and gulches, with Shirttail Creek an especially rich source. The neighboring Weatherby area, approximately 10 miles (16 kilometers) southeast of Durkee, contained important placer and lode mines, particularly along Chicken and Sisley creeks (Eastern Oregon Mining Association 1999).

The Sparta District lies roughly 19 miles (31 kilometers) north-northeast of Durkee, from the southern foothills of the Wallowa Range through drainages along the Powder River. Placers were worked early in the 1860s; after 1873 the mines were supplied with water by the Sparta Ditch. The Sparta District was mined extensively for lode deposits, especially around Eagle Creek (Gilluly et al. 1933). The district declined rapidly after 1892 and was idle between 1952 and 1959. Through 1959, production from the district was 35,200 ounces of lode gold and 7,700 ounces of placer gold (Eastern Oregon Mining Association 1999).

The Virtue District, located roughly 4 miles (6 kilometers) east of Baker City, experienced intensive placer and lode mining. The Union (or Rockafellow) Mine was established in 1862 and was sold to

Colonel J. Ruckel in 1864. In need of a reliable water source to process ore, Ruckel built the 10-stamp ore-processing Ruckel Mill on the Powder River at the site of what would become Baker City. Ruckel sold his mining claim to James W. Virtue and A. H. Brown in 1868, which gave rise to the Virtue Mine. Located at the southern end of Virtue Flat, this lode mine was one of the largest producers in Oregon, yielding some $2.2 million into the 1920s. Other important mines in the district include the Brazos, Carroll B., Chicago-Virtue, Cliff, Flagstaff, Koehler, Norwood, and White Swan (Eastern Oregon Mining Association 1999; Gilluly et al. 1933:73). The many prospect adits and pits scattered across the district attest to the intensity of mining in the area. Gold production in the Virtue District through 1959 was 126,000 ounces of lode and placer gold (Eastern Oregon Mining Association 1999).

Other Mineral Mining

Although gold was the principal mineral mined in eastern Oregon and Idaho during the nineteenth and twentieth centuries, other mineral commodities also were prospected in Owyhee County in Idaho and Baker and Malheur counties in Oregon. Most nongold minerals were first quarried during the early twentieth century. Unlike gold mining in the region, heightened activities continued in some areas during and after the World War II (WWII) period. Minerals prospected in Owyhee County include quartz, marcasite, calcite, clay, cinnabar, copper, silver, and several gemstone types. Of these minerals, silver proved to be the most economically significant, rivaled only slightly by gold. Minerals prospected in Baker and Malheur counties include limestone, granite, coal, manganese, uranium, calcite, pumice, copper, diatomaceous earth, and asbestos. Of these minerals, limestone proved to be the most economically significant.

The Birmingham Group was one of Owyhee County's more productive collection of mines and claims; located in 1921 by Arthur and Howard Birmingham, the group originally consisted of 14 unpatented claims in Astor and Twilight gulches. The Treasure Vault, Silver Queen, Northern Extension of Silver Queen, and Crescent mines actively were worked through the 1870s, with numerous tunnels and shafts or large dumps documented at the time. The amount of effort put into these mines varied significantly over the next 80 years (Piper and Lacey 1926:159–161). Stibnite also was mined in the Birmingham Group mines but only in conjunction with silver production for economic reasons (Popoff 1952).

The Trade Dollar-Black Jack Mine contained the highest ratio of silver to gold ore among all Silver City mines, with Piper and Lacey (1926:119) reporting a ratio by weight of 1:138.6 for the recorded production of the mine at the time of publishing. The Black Jack Mine was the first to be claimed in the Florida Mountains; the mine was excavated to 220 feet (67.1 meters) below ground in 1899 before it was forced to shut down due to large amounts of water in the shaft. Later that year, the mine was merged with the Trade Dollar Mine and became the Trade Dollar Consolidated Mining Company, owned by a Pittsburg-based company (French 1914:146; ISHS 1964). The Trade Dollar Mine was located along the same vein as the Black Jack; tunnels from each mine connected along this vein at a depth of 1,200 feet (365.7 meters) in 1896. By 1910 the Trade Dollar-Black Jack Mine had produced a value of nearly $13 million, with more than $10 million in value from silver ore (Mitchell 2010:18–47). Marcasite and argentite also were mined in small quantities at the Trade Dollar-Black Jack Mine (Sanford and Stone 1914:63–64, 67).

The Marble Creek area of Baker County was mined for limestone beginning in 1893 with a patented claim to the Monarch Marble Mine. Through 1900, some 6,000 tons of limestone from this mine were squared and burned for use in the Baker County area. Activity ceased after 1900, with exploration work resuming in 1948 through the Marble Creek Limestone Quarry (Wagner 1949). Work continued until 1963, when the Marble Creek quarry was closed and the neighboring Baboon Creek quarry was developed and operated by the Chemical Line Company. The Baboon Creek quarry operated from 1958 to 1971 when the plant and quarries closed (The *Record-Courier* 1995).

During the early 1900s, Lime, Oregon, was a hub of mineral limestone processing. In 1907 a lime kiln operated in the vicinity of Lime (McArthur and McArthur 2003); in 1916 the Acme Cement Plaster Company built a plant at Lime to produce plaster (McArthur and McArthur 2003); and in November 1923, the Sun Portland Cement Company built a cement plant in Lime to serve western Idaho, eastern Oregon, and southwestern Washington (McCaslin 1965:29). Because of overlapping stockholders, cement company interests were merged in September 1926 to become the Oregon Portland Cement Company (McCaslin 1965). By the 1960s, the Lime facility produced 1.2 million barrels of cement per year. As the nearby limestone deposits were depleted, limestone was brought from the Nelson area, near Durkee, Oregon. Hauling the lime became impractical, and so a new plant was built at Nelson in 1979 and the facility at Lime was closed in 1980. The ruins of the limestone plant are still present today. The Western Lime Quarry, located 3.5 miles (5.6 kilometers) southeast of Durkee, in Burnt River Canyon, consisted of 24 placer claims (Prescott n.d.). Mine operations identified in the B2H Project area include the Rachel, Cliff, Cyclone, Flagstaff Hill, Grey Eagle, Columbia, Con-Virginia, Emma, Hidden Treasure, St. Paul, and Virtue Flat mines.

Timber and Logging

Early settlers in eastern Oregon initially participated in logging to construct and maintain their farms and ranches (Tucker 1940:70). The earliest commercial timber harvesting efforts were initiated to supply the mining industry. Moving into the latter part of the nineteenth century, timber was produced for local and increasingly regional consumption. With the construction of the OSL Railroad in the 1880s, the industry gained access to national lumber markets and logging became an important economic driver for the region (Powell 2008).

The timber industry experienced a financial and production downturn during the Great Depression, following the overall national decrease in development projects and decreased demand. However, the onset of WWII spurred foreign and domestic demand with increased production levels into the 1950s when the practice of second-growth timber harvesting began. The timber industry continued to play a major role in Oregon's economy during the second half of the twentieth century, representing one-fifth of the nation's domestic lumber supply by 1960 (Andrews and Kutara 2005:1).

During the latter part of the twentieth century, mills became more permanent with the lumber companies acquiring their own land. The Oregon Lumber Company in Baker City, the Grande Ronde Lumber Company in La Grande, the Baker White Pine Lumber Company of Sumpter and Baker City,

and the East Oregon Lumber Company in Enterprise are just a few of the larger mills that developed in the region (Hartmans et al. 2001:8[5]; Powell 2008).

Some of the historic mills located in, or near, the study corridor include the mills at Dry Gulch, Government Springs, and Grande Ronde River (Tucker 1940:77–79). Properties associated with timber and logging in the study corridor could include temporary camp and work sites, railroad grades, splashdams, skid trails, and spring board stumps, among others. Historic roads, such as the Quartz Mill Road, within the study corridor were used to transport wood and cut lumber.

Development

Idaho was settled largely by immigrants who were relocating from other parts of the West and who sought to acquire gold or land, while in reality, many of them ended up making a living as farmers or storekeepers during the gold rush years and afterward continued to raise livestock and crops. Few people initially were drawn to Idaho for its land, much of which, especially on the Snake River Plain, appeared sterile and uninviting (Schwantes 1991:96). Once the gold rush ended, many who stayed realized that crops grew well on the sage-covered flats of the Snake River Plain, as long as water was available. The early twentieth century initiation of large-scale irrigation made it possible to successfully settle and farm this area (Schwantes 1991:96–97).

Ranching and agriculture have played a major role in the economic development of the Pacific Northwest, from the turn of the twentieth century through today. Ongoing improvements to irrigation and canal and dam construction in the early 1900s precipitated additional economic settlement and development. With improved water features, native vegetation began to be replaced by croplands of grains, sugar beets, potatoes, and alfalfa, which resulted in a disruption of the natural hydrologic system (Franzen 1981:228). Depression-era Civilian Conservation Corps and Work Projects Administration initiatives during the 1930s enabled the unemployed to find work and helped establish larger-scale irrigation in Idaho and Oregon through the construction of canals, dams, and other federal projects. In the La Grande area, trails, campgrounds, and horse trails were built, roadsides were cleaned, public landscapes were managed, and the high school's football field was constructed (Hartmans et al. 2001:8[10]). Many of the currently in-use canal headgates throughout the study corridor were constructed during this time (Franzen 1981:228).

Between the mass development of agricultural lands and the environmental disturbances caused by overgrazing and deforestation, many people in the early twentieth century acknowledged how fragile and finite the natural landscape was; as a result, there was the call for public lands in Idaho and Oregon to be set aside for management by federal agencies, including the USFS, the Grazing Service, and, later, the BLM (Franzen 1981:228–229).

To evaluate the quality and condition of forested lands, the Office of the Special Agent was created in the U.S. Department of Agriculture in 1876. This office was expanded into the Division of Forestry in 1881 with the first timber land reserve established in 1891 by President Harrison, who placed the reserve under the control of the GLO. In 1901 the Division of Forestry was renamed the Bureau of

Forestry. The Transfer Act of 1905 created the USFS and relocated the management of national reserves and grasslands to reside under the Department of Agriculture (USFS n.d.).

The Taylor Grazing Act of 1934 created a system to manage federal grazing lands through the Department of the Interior's newly created Division of Grazing. A main goal of the act was to "stop injury to the public grazing lands by preventing overgrazing and soil deterioration" and, in general, to regulate farmers' and ranchers' use of public lands across the 10 involved states (U.S. Congress 1934:1269). In 1939 the Division of Grazing was renamed the Grazing Service with the headquarters moved to Salt Lake City, Utah, during WWII. Management of land was divided among 10 regional grazing offices and 61 grazing districts and included 142 million acres (57.6 million hectares); land determined to have little potential for livestock grazing (e.g., tracts were too scattered for effective management, land was either too densely forested or too hot and dry, and land in Alaska) was not included in these districts (The Public Lands Foundation 2012:7–9). On July 16, 1946, the Grazing Service was merged with the GLO and became a new agency altogether, the BLM (BLM 2013; Franzen 1981:190–191).

Although the economy continues to be affected by periodic droughts and depressions throughout the twentieth century, to date, western Idaho and eastern Oregon retain their agricultural economy, which rests surely on sugar beets, potatoes, onions, dairy farms, and feedlots.

Homesteading

While immigrant squatters on public lands gained the authority to purchase tracts of land of up to 160 acres (65 hectares) from the federal government through the Preemption Act of 1841, it was the Homestead Act of 1862 that dramatically drove new settlement in the West. The Homestead Act, signed by President Abraham Lincoln during the American Civil War, provided a tract of 160 acres to any U.S. citizen, or intended citizen, who had never borne arms against the U.S. Government, provided that the claimant lived on the land for five years and improved the land by building a 12 foot (3.7 meter) by 14 foot (4.3 meter) dwelling and cultivating crops. After the 5 year period, the homesteader could file for a deed of title by submitting proof of residency with land improvements and by paying a nominal registration fee to the local land office. This system allowed citizens access to land without any upfront land purchase costs (National Archives n.d.; Porterfield 2005:25–30).

Following the Homestead Act, Congress passed the Timber Culture Act in March of 1873 that authorized an additional 160 acres (65 hectares) to any homesteader who agreed to plant trees on 40 acres (16 hectares) of their allotted land and cultivate the trees for 10 years. The legislation allowed for land speculators to consolidate large landholdings. Subsequent amendments of the act reduced the area of tree planting to 10 acres (4 hectares). The purpose of the act was to establish groves of trees in the hope that they would create a more humid climate that would provide better agricultural land and, thus, bring more rainfall to drought-stricken prairies. In addition to creating another method by which additional land could be acquired by residents, the act provided materials for buildings, fencing, and fuel for newly arrived and existing settlers (Porterfield 2005:44). The Timber Culture Act was particularly susceptible to fraud and, therefore, the act was revised in 1874 and 1878 before it eventually was repealed in 1891 (Hedin n.d.).

The Desert Land Act was passed by Congress on March 3, 1877, and was intended to encourage and promote the economic development of arid and semiarid public lands in the western states (BLM 2009). The act offered 640-acre (260 hectares) tracts of land to any married couple who could pay $1.25 per acre and promise to develop and irrigate the land within three years; a single man could receive 320 acres (130 hectares) for the same price. Conditions of the act were that applicants be naturalized citizens and be either the head of household or a male over the age of 21 who had never borne arms against the U.S. Unlike the Homestead Act, the Desert Land Act did not include a requirement to construct a residence, only to develop irrigation within three years (Gates 1978:12–13).

In 1909 Congress passed the Enlarged Homestead Act, an amendment to the Homestead Act of 1862, which raised the amount of land deeded to each homesteader from 160 to 320 acres (65 to 130 hectares) to better enable dryland farming (Gates 1968). Considered by many as the “Dry Farm Homestead Act,” the act stipulated that only non-mineral, non-irrigable, and non-merchantable timber land could be acquired, provided that at least one-eighth of the land continuously be cultivated for agricultural crops with five years to make all necessary improvements; Congress decided in 1912 that five years was too long for the residential and agricultural requirement and passed the Three-Year Homestead Act (Meinig 1955). More land in the western U.S. was claimed between 1905 and 1920 than during the previous four decades since the Homestead Act was first passed, with much of this land requiring the dry-farming techniques allotted through the Enlarged Homestead Act (The Oregon History Project 2014). The dry farming boom that occurred after the turn of the twentieth century was aided by a research study conducted by Hardy Webster Campbell, which touted the benefits and ease of dryland farming in the arid west, particularly on homesteads greater than 160 acres (65 hectares) in size (Campbell 1902). While Campbell was refuted easily by the director of the Office of Dry Land Agriculture in the Department of Agriculture, the increased interest in dry farming remained (Layton 1988:25–26). Because dryland farming was not as easy or successful as many came to believe, a large number of homesteads were not successful; while there were various factors involved, it has been estimated that the success of homesteads across the U.S. was only approximately 40 percent (BLM 2012b), with many of the homesteads that were deemed successful on paper actually being fraudulent or not benefiting the settlers intended (i.e., the land actually was settled by speculators or corporations, the land was not operated by those who claimed it, and in general, the act failed to help the poor) (Edwards 2009:184–186).

The Stock-Raising Homestead Act of 1916 provided an allotment of 640 acres (260 hectares) of public land to settlers for ranching purposes. The most significant difference between the Stock-Raising Homestead Act and prior homesteading acts is the separation of surface and subsurface rights, with settlers receiving only the claim to the surface of their plots with the subsurface, or mineral, rights retained by the federal government. Settlers were required to stay on the land for three years and to make improvements deemed necessary by the government, which did not include the cultivation of land through this act (BLM 2006; Danver 2013:620; U.S. Congress 1916:862). Also of great significance to the Stock-Raising Homestead Act was the designation of stock driveways “for use in the movement of stock to summer and winter ranges or to shipping points” with restrictions on the width of the driveway in relation to their length as well as on how far animals could be moved in a single day (U.S. Congress

1916:865). The power to designate stock driveways rested with the Secretary of the Interior under the GLO; by April 12, 1917, 136,291 acres (55,155 hectares) in eastern Oregon were under review for inclusion as stock driveways (Commissioner of the U.S. GLO 1917:16).

Irrigation

Farming became the way of life in arid eastern Oregon during the late 1800s, but the lack of adequate irrigation limited agricultural productivity. Old mining ditches were put back to work to provide water for orchards, hayfields, row crops, and dairy cows with limited success until a more formal system of irrigation ditches was developed (Braswell 1986).

The Carey Act of 1894, passed on August 18 of that year, allowed for private companies in the U.S. to construct irrigation systems in the semiarid western states and profit from the sales of water while the federal government disposed of arid public lands. The act, which was managed by the GLO under the supervision of the federal government, provided as much as one million acres (404,686 hectares) of land to each western state to be regulated by the state to determine qualified potential claimants and investors. In most states, claimants had to pay an entry fee plus a small amount for the land and meet several guidelines. The act was particularly successful in Idaho and Wyoming. In 1908 Idaho received an additional two million acres (809,371 hectares) and Wyoming received an additional one million acres to develop under the Carey Act. Today, approximately 60 percent of lands still irrigated through the Carey Act are located in Idaho. Successful projects that benefited from the Carey Act in Idaho include the Boise and Twin Falls projects (Pisani 2002).

The Newlands Reclamation Act of 1902 allowed the federal government to appropriate land in the arid West; commission projects for water diversion, retention, and transmission; and sell the land for homesteading, and to then put any profits back into development. Organized through the U.S. Reclamation Service (which became Bureau of Reclamation in 1923), investigations were conducted throughout Oregon and Idaho, among the other 14 states included when the act originally was passed, to assess those areas best suited for reclamation (NPS n.d.c).

Between 1902 and 1907, approximately 30 reclamation projects were undertaken (Reclamation 2016); one such endeavor was the Umatilla Basin Project's Hermiston Irrigation District, a large-scale development designed to divert water from the Umatilla River to agricultural fields in northern Umatilla County. The project centered on the 1906 to 1908 construction of the Feed Canal Diversion Dam and Canal that carried water from the Umatilla River to the 115-foot-high (35.1-meter-high) Cold Springs Dam that created the Cold Springs Reservoir; these elements make up the East Division of the Umatilla Basin Project and, along with the West Division, were authorized by the Secretary of the Interior in 1905 (McKinley 2012:5). Below the dam, the water was dispersed to croplands through a series of pipes and canals. The Cold Springs Reservoir is operated by Reclamation, with all other facilities managed by their respective districts (Reclamation 2012a, 2013). The West Extension Irrigation District makes up the West Division of the Umatilla Basin Project. The West Extension Irrigation District was formed in 1919 and includes the Three Mile Falls Diversion Dam that diverts water through the West Extension Main Canal. The dam is 24 feet (7.3 meters) high and the canal is 27 miles (43.5 kilometers) long. All West Division facilities have been operated by the West Extension Irrigation District since 1926

(Reclamation 2009, 2013). Between 1923 and 1927, Reclamation constructed the McKay Dam and McKay Reservoir, which supplied water to the Stanfield and Westland Irrigation districts, making up the features of the South Division of the Umatilla Basin Project. The earth-filled dam is 165 feet (50.3 meters) high and was modified between 1978 and 1979 to increase capacity, which was instrumental in furthering the agriculture capabilities of the area. The McKay facilities are operated by Reclamation while the Stanfield and Westland districts manage their own facilities (Reclamation 2012b, 2013; USFWS 2013).

In 1927 Reclamation initiated the Vale-Owyhee Project as one of the single largest reclamation undertakings of the whole program, located along the Snake River in the Owyhee and Malheur valleys. The project included construction of the 417-foot-high (127.1-meter-high) Owyhee Dam (which was at the time the highest dam west of the Mississippi), a 3.5-mile-long (5.6-kilometer-long) diversion tunnel, 5 miles (8.0 kilometers) of additional tunnel, a 2.5-mile-long (4.0-kilometer-long) steel siphon, and 200 miles (321.9 kilometers) of canals (Rogers and Pfaff 2010:4). The dam was part of a faceted project, where the first facet consisted of other developments on the west side of the Snake River, which included the Owyhee and Malheur rivers, and the second facet consisted of projects adjacent to Vale toward the north, which included the Vale Irrigation District (Robbins 1997:277–279). Completed in 1932, the Owyhee Dam began delivering water to farmers in 1935. By 1965 the Vale-Owyhee Project was irrigating more than 111,000 acres (44,920 hectares) and in the 1970s, the value of crops irrigated with Owyhee water peaked at $50 million. Today, the area irrigated by the Vale-Owyhee Project continues to produce sugar beets, alfalfa, onions, corn, and mint, among others (Stene 1996:17). The Owyhee Dam Historic District, which includes the dam, buildings, and structures associated with the Reclamation Service residential camp, and several features in the industrial zone, was listed in the NRHP in 2010 (Rogers and Pfaff 2010).

The Vale Irrigation District was authorized in 1926 and founded in 1929 and currently provides water to nearly 35,000 acres (14,164 hectares) in the vicinity of Harper, Vale, Willowcreek, and Jamieson, Oregon. The Vale Irrigation District includes the Bully Creek Dam and Bully Creek Reservoir. The Bully Creek Dam is an earthen structure 121 feet (36.9 meters) in height that was constructed in 1963 (Reclamation 2012c; Vale Oregon Irrigation District 2007).

Other cultural resources related to the context of irrigation that may be found in the study corridor include ditches, dams, spillways, siphons, canals, headgates, historic fields, orchards, and homesteads.

Ranching

The ranching industry provided beef, mutton and lamb, pork, chicken, milk, cheese, and wool to settlers of the region. Cattle and horses also provided the necessary power for plowing agricultural fields and pulling wagons and other machinery and provided leather for clothing and other items. The ranchers and farmers who arrived in the nineteenth century found domesticated horses necessary for conducting daily activities. Cattle first were introduced to the region at Neah Bay Washington in 1792 and by the early nineteenth century had spread into eastern Washington (Galbraith and Anderson 1971:7). Later,

numerous herds of cattle and sheep were driven north from California and west from the Great Plains into the Columbia Plateau region.

Cattle and sheep ranching expanded into and developed more fully in eastern Oregon during the 1850s and 1860s, when miners moved into the Columbia Basin. For the most part, ranchers sold their meat and milk locally; this changed in the 1870s when ranchers were forced to look beyond the Pacific Northwest to compensate for the oversaturated industry in the region. At this time, cattle also were used to create base herds in the Rocky Mountains. The practice of driving cattle over long distances effectively ended in the 1880s with the creation of the Northern Pacific Railroad, the Utah and Northern Railroad, and the OSL, which shipped cattle by rail (Galbraith and Anderson 1971:8–9).

By the time ranchers actually began to settle Idaho's Owyhee County in 1864, the beginnings of infrastructure already had been established by the region's gold and silver miners; many of the first herds actually followed many miners north from the California rushes into Idaho. Open-range ranching, particularly of cattle, in Owyhee County reached its peak alongside mining activities in the area when the food and commodities created by the ranching industry were in high demand in a relatively sparsely developed area (ISHS 1964). Witnessing the increasing demand for beef and milk cattle, a group of men from Owyhee, including Con Shea, George Miller, Tom Bugbee, and Bob Enos, led the first official cattle drive from Texas to the Bruneau Valley in 1869 and solidified the cattle industry in southern Idaho. The Owyhee County Cattle and Horse Growers' Association was created in 1878 as a means to protect stockmen and their herds against attacks by Native American tribes and others (Owyhee Cattlemen's Association n.d.). Throughout Idaho there was no shortage of places to graze, with an estimated 17 million acres (6.9 million hectares) of grazing lands across the state's roughly 55 million acres (22.3 million hectares), with most grazing land covered with the preferred bunch grasses and white sage (The Owyhee Avalanche 1898:8). During 1888 and 1889, cattle reached their largest numbers of the nineteenth century in Owyhee County, including more than 100,000 head, with the largest single owner being Murphy and Horn (The Owyhee Avalanche 1898:13).

The practice of open-range ranching on lands surrounding an established headquarters was common practice until the 1890s when, after a series of severe winters, ranchers finally accepted that shelter and feed during the winter were necessary for a successful operation (Galbraith and Anderson 1971; ISHS 1964). Large-scale changes in land management, however, ultimately put an end to the practice of open-range ranching. Following enactment of the Homestead Act, land began to be fenced off with property lines delineated, preventing free movement of herds and limiting travel along established sheep and cattle drive routes. In 1897 the federal government further limited open range with the creation of forest reserves to protect damaged range lands, after which a limited number of grazing leases were available to ranchers, again reducing their access to public lands (Galbraith and Anderson 1971). After the Stock-Raising Homestead Act of 1916 was passed, grazing leases again became more accessible and stock driveways were designated through areas selected for ranching and grazing (U.S. Congress 1916:862–865).

The first Basque populations arrived in this region during the late 1880s, with many settling in eastern Oregon, near Jordan Valley, Steens Mountain, and Ontario, and in the Boise and Nampa areas of

Idaho. American Basques were sheepherders or livestock men who followed the mining booms from California and Nevada into Oregon and Idaho (Compean n.d.). While many emigrated directly from their traditional territories in the Pyrenees Mountains between France and Spain, others came from South America (Douglass and Bilbao 2005; Etulain 1991). Basque migration to the U.S. peaked between 1900 and 1920 and had a direct effect on the economic, political, and cultural conditions of the American West and on the growth of the sheep industry in the Pacific Northwest. Estimates from southeastern Oregon indicate that Basque populations made up more than half of the 1,000 to 2,000 residents of the region and may have represented 90 percent of the area's sheepherders (Etulain 1991).

Restrictive immigration laws began to be passed by Congress that significantly limited Basque immigration, particularly the Immigration Act of 1920 and the Quota Act of 1924. The Quota Act of 1924 stated that a maximum number of 131 Spaniards could be admitted into the U.S. annually. This measure particularly limited the influx of herders from Vizcaya and Navarra, the two areas where the bulk of Basque sheepherders found in the American West originated (Douglass 1985:16). While the French were afforded a larger quota than the Spanish, they were not as large a source of labor (Douglass 1985:16).

These restrictions compounded the difficult economic times experienced by Basque families due to the Great Depression and the passing of the 1934 Taylor Grazing Act. The Taylor Grazing Act restricted grazing allotments on public lands, which forced the Basque to reduce the size of their sheep herds (Douglass 1979:296). Local sheep industries also were affected by overseas competition and a diminished demand for wool.

In the post WWII era, Congress passed laws to again encourage immigration of sheepherders, leading to a new wave of Basque immigrants settling into Idaho and Oregon (Compean n.d.) Besides working as sheepherders or ranch-hands, some Basque men secured work as miners or laborers on irrigated farms. Several Basques also owned their own ranches, opened boarding houses, or sought work in other industries. The roughly 15,000 people of Basque descent living in Boise, Idaho, making up the largest population concentration outside of Europe (Compean n.d.).

Evidence of Greek sheepherders also is present in the area. Several historical sites on Lookout Mountain contain dendroglyphs, which may be attributed to Greek families (Oman 1999). Cairns at sites in this area could be ascribed to Greek sheepherders, with anecdotal histories suggesting a Greek presence among the sheepherders, although the physical remains of all sheepherders is by and large the same (Kirby 1989).

Many unnamed homesteads, cabins, and roads are depicted on historical maps throughout the study corridor. In areas that are not known to have been involved actively in the timber or mining industries, these properties commonly have been associated with ranching.

Military Facilities

Throughout history, military occupations in the study corridor have been limited. The Umatilla Army Ordnance Depot was designated in 1940 near the Columbia River between Morrow and Umatilla counties. Constructed and opened in 1941 in anticipation of WWII, the depot originally was intended to store and upkeep a variety of common military items, including blankets, bombs, and ammunition, among the 1,001 munitions storage bunkers (igloos) on-site. The Umatilla Army Ordnance Depot employed 2,000 people during WWII, more than a quarter of whom were women. After WWII, the depot continued to store supplies and aided in various other military conflicts, including the Korean War and Desert Storm. Many of the nearby towns, including Umatilla and Hermiston, experienced growing pains caused by the large number of people moving to the area to work at the depot. In 1962 the facility's name was changed to the Umatilla Army Depot when it began receiving chemical weapons. The depot housed rockets, bombs, projectiles, mines, bulk containers, and aerial spray tanks filled with liquid nerve and blister agents; shipment of these items to the Umatilla Army Depot stopped in 1969. In 1988 it was determined that the chemical weapons should be destroyed and the depot was placed on the Base Realignment and Closure list. The depot's name was changed once more in 1996 to the Umatilla Chemical Depot. Between 2004 and 2011, the chemical weapons were destroyed through high-temperature incineration technology, and in 2012 the depot was closed (CCRH n.d.a, n.d.b; Oregon Encyclopedia 2016; U.S. Army Chemical Materials Activity 2012).

The NWSTF Boardman is an aerial bombing and gunnery range located immediately south of Boardman, Oregon. The land for the NWSTF Boardman was set aside by executive order in 1941. When military use of the area began in 1943, the NWSTF Boardman was used by the U.S. Army Air Corps and, later, the Air Force. In 1958 the Navy was given permission to use the land for aerial bombing, with a full transfer of the lands to the Navy in 1960. The NWSTF Boardman range is managed by Naval Air Station Whidbey Island as was delegated by the Commander, Navy Region Northwest. Since the early 1990s, the NWSTF Boardman has been used by the Navy, Oregon National Guard, Marine Corps, Air Force, and U.S. Air Force Reserve (Navy 2015:1–5).

Settlements

While several cities and towns of Idaho and Oregon have been discussed under the context of various industrial and developmental histories, the following fuller discussions of individual settlements is necessary for those locations with a larger number of historical properties present.

Boardman, Oregon, lies at the northern extent of the study corridor along the Columbia River. Most of the historic extent of the city has been inundated by Lake Umatilla since the 1970s when the John Day Dam was constructed to the east of The Dalles (CCRH 2016f). The original site of Boardman was homesteaded by Samuel Herbert Boardman beginning in 1903 with the town site platted in 1916 (Engeman 2009:52). Boardman worked to develop dryland irrigation in the area. The West Extension Irrigation Project established the West Extension Irrigation Canal and brought water from the Umatilla River to help irrigate Boardman, causing a rush of homesteaders to settle the area, which allowed Boardman to be incorporated in 1921 (Wilkerson 2013).

Echo marks the Lower Crossing of the Umatilla River, the location along the Oregon Trail where, in 1847, immigrants began crossing the river to the south of Pendleton (the location of the Upper Crossing) and, as a result, opened up the Columbia Plateau Route of the Oregon Trail. In 1851 the Umatilla Indian Agency was built, the first of its kind for the Umatilla, Cayuse, and Walla Walla tribes. The agency was burned to the ground in 1855 during one of the few incidents of the Yakima War as far south as Echo (most of the conflict occurred in Washington between the Columbia and Yakima rivers) (Schwartz 1997:83). Where the agency first stood, Fort Henrietta was constructed as part of war-time efforts; the fort was occupied briefly until 1856. Immigrants from the Oregon Trail began settling near the Lower Crossing in 1860 and established Echo Meadows, which became one of the first agricultural locales in Umatilla County where hand-dug irrigation ditches watered alfalfa, corn, and other crops. In 1861 Brassfield's Ferry was placed at the crossing, after which a bridge was constructed (Query 2008:44). The town was first plotted in 1880 and was incorporated in 1904. The OR&N extended a line through Echo, allowing the town to become a major shipping point for grain, wool, sheep, and cattle (City of Echo 2016; Doyle 2016).

The current location of La Grande exists almost exclusively because of the OR&N, although it also was aided by its designation as county seat, by its successful timber and agricultural industries, and by the presence of Chinese populations. Before the modern La Grande was constructed, an "Old Town" La Grande existed to the north, outside the study corridor. When Union County was created in 1865, La Grande was designated the county seat. While there were many contests and challenges to this title, mostly from Union, La Grande has kept the official designation as of 1904 (Hartmans et al. 2001:8[4]; Hug 1961:67–77).

With the completion of the OR&N through northeastern Oregon in 1884, many local towns, including La Grande and Pendleton, vied to be depots and diversion points for the railway; La Grande was awarded the local diversion point and, as a result, became a major commercial and residential hub (Engeman 2005; Hartmans et al. 2001:8[3]). While prospectors and stockmen had passed through the area for decades, it was not until the rail line and facilities were completed that industry centralized here, with most of "Old Town" La Grande relocating closer to the tracks in "New Town" and those in the commercial endeavors of livestock, natural grasses, dried fruits, apples, potatoes, wheat, hay, barley, oats, sugar beets, and timber all found industrial footholds afforded by the railway. In the first five years of La Grande's rail activity (1884 to 1889), the population and number of businesses nearly tripled, from 600 to 1,500 people and 39 to 96 businesses; the population more than doubled again in the following four years and reached 3,500 people by 1893 (Hartmans et al. 2001:8[4–7]).

The Chinese immigrants of La Grande played a significant role in the development of the mining industry and in railroad creation. Chinese immigrants were imported to the Pacific coast in the nineteenth century as laborers, making it to eastern Oregon in 1862 for mining and to La Grande in the 1880s for the railroads. A Chinatown was established in La Grande and functioned without incident until 1893, when members of La Grande decided to uphold the Geary Act. Relevant to the Geary Act of 1892, unregistered Chinese were to be deported; in a matter of days, most of La Grande's Chinese were deported with little or no consideration as to their legal status. A short economic upturn in the late

1890s created a situation in which Chinese were able to move back to La Grande, although poor living conditions and internal conflict, including the Tong Wars, inevitably resulted in the near-permanent departure of all Chinese residents (Hartmans et al. 2001:8[5–6]).

La Grande was incorporated in 1891 and, despite the considerable devastation brought about by a series of fires, the town's population grew rapidly in the early 1890s. This boom necessitated the construction of new schools, churches, social and fraternal buildings; the founding of three weekly newspapers; and the expansion of the La Grande Edison Electric Light Company, which by 1898 was supplying electricity to every business and many of the homes in La Grande. By the 1910s, La Grande's downtown was a booming service center, with hotels, rooming houses, restaurants, saloons, billiard halls, and shops, which mainly served the railroad industry. By the end of the 1920s, the population of La Grande had grown to more than 8,000, securing its place as one of the largest cities in the region (Hartmans et al. 2001:8[7–10]). Throughout economic downturns, prohibition, and the invention of the automobile, La Grande innovated and changed with the times. La Grande's commercial district was added to the NRHP in 2001 for having "a concentration of historic resources that reflect the early development of La Grande as the leading trading and shipping center in Union County" (Hartmans et al. 2001:8[1]).

After the discovery of gold in Griffin Gulch near Baker City in 1861, the town grew rapidly and a formal town site was laid out in 1864 with the county seat assigned in 1866. Also referred to as the "Queen City of the Mines," the settlement became a commercial and financial center for the surrounding mining districts and lumber industry (Potter 1995:95), which only continued to increase when the OR&N route was completed through Baker City in 1884. By the end of the nineteenth century, the population had reached approximately 7,000 people, making Baker City the largest settlement and economic center between Salt Lake City and Portland. The Baker Historic District was nominated to the NRHP in 1978, although its spatial extent lies just west of the study corridor (Baker County Chamber of Commerce n.d.; Western Mining History n.d.).

The town site of Huntington was first homesteaded in 1862 by Henry Miller, who established a stage line tavern known as Miller's Tavern. Significant segments of the OSL and OR&N became a single line at Huntington in 1884, establishing the locale as an important point along the rail line (Workers of the Writers' Program of the Work Projects Administration in the State of Oregon 1940:251). Located near Olds Ferry, Huntington received considerable traffic from those towns along the Olds Ferry Road of the Oregon Trail and from the railroads.

3.2.13.1 Affected Environment

Cultural Resources Inventory Summary

Cultural Resources Site Data

Class I literature search and Class II cultural resource survey efforts for the B2H Project resulted in the identification of 946 cultural resource sites in the 4-mile-wide study corridor. These previously recorded sites include 470 pre-contact sites, 398 historic sites, and 60 multi-component sites (pre-contact and historic components). Eighteen additional sites are of "unknown" temporal affiliation. Cultural resources

categorized as "unknown" are those for which incomplete site records were found and, consequently, to which a particular period (temporal affiliation) could not be assigned. In Oregon, previously recorded sites consist of 350 pre-contact sites, 347 historic sites, 46 multi-component sites, and 14 sites of unknown temporal affiliation. In Idaho, previously recorded sites consist of 120 pre-contact sites, 51 historic sites, 14 multi-component sites, and 4 sites of unknown temporal affiliation. Additional Class III inventory will likely result in the identification of more and/or different site types. Table 3-439 provides a summary of the number of sites by NRHP eligibility status and temporal affiliation. To clarify, this table represents previously recorded sites with either definitive physical manifestations or cultural materials, or both, revealed by cultural resource pedestrian surveys. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segments of NHTs or Study Trails) are not included in the quantitative analysis. These significant resources are discussed qualitatively.

Table 3-439. Number of Sites by National Register of Historic Places Eligibility Status and Temporal Affiliation

Eligibility	Number of Previously Recorded Sites[1]				Total Number of Previously Recorded Sites
	Pre-Contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	
Oregon					
Listed Sites	0	3	0	0	3
NRHP-Eligible Sites	52	40	13	1	106
Contributing Segments of the Oregon National Historic Trail and the Goodale's Study Trail[3]	0	17	0	0	17
Not Eligible Sites	27	57	0	1	85
Unevaluated Sites	271	230	33	12	546
Total	350	347	46	14	757
Idaho					
Listed Sites	0	2	0	0	2
NRHP-Eligible Sites	5	5	3	0	13
Contributing Segments of the Oregon National Historic Trail[3]	0	1	0	0	1
Not Eligible Sites	8	14	0	0	22
Unevaluated Sites	107	29	11	4	151
Total	120	51	14	4	189

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

NRHP = National Register of Historic Places

Pre-contact site types identified include lithic scatters, lithic and tool scatters, artifact scatters, lithic procurement areas, artifact scatters, short- and long-term campsites, hunting blinds, rock images, ceremonial sites, habitations (pithouses, rockshelters, and a village/campsite with a Paleoindian component), rock features (cairns and rock alignments), human burial sites, culturally modified trees, special activity sites (game trap and processing station), and a ceramic scatter (possible pot drop). Numerous rock image sites (petroglyphs and pictographs) have been identified in the vicinity of the study corridor (southern end).

Historic site types identified include single- and multiple-episode artifact scatters, quarries, campsites, inscriptions, isolated features or structures (e.g., rock alignments, cairns, foundations), isolated graves, cemeteries, livestock enclosures, kilns, mining-related sites (prospects, isolated mines, mine complexes, and mine camps), military facilities, buildings and habitation structures, homesteads, town sites, bridges, waterworks, utility lines, and transportation corridors (NHTs and trails under study for designation [Study Trails]). Numerous sites with both pre-contact and historic components have been identified in the study corridor. Nearly all of the multi-component sites contain a combination of the aforementioned site types.

Multiple segments of the Oregon NHT are present in the study corridor. These include previously recorded and unrecorded segments of the trail (refer to map MV-25 for inventory data). Portions of the Oregon NHT are located in the BLM Oregon Trail ACEC (Echo Meadows, California Gulch, Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, Chimney Creek, Tub Mountain, and Birch Creek parcels). For information regarding the Oregon NHT ACEC, refer to Sections 3.2.6 and 3.2.15. Segments of the Lewis and Clark NHT also have been documented in the vicinity of the study corridor. Study Trails include the Goodale's Cutoff Study Trail, the Meek Cutoff Study Trail, the Olds Ferry Road, the Upper Columbia River Route Study Trail, and the Umatilla River Route and Columbia River to The Dalles Study Trail (refer to map MV-26 for inventory data). The feasibility of adding these trails to the Oregon NHT currently is being studied by the NPS as part of the larger Four Trails Feasibility Study, which was authorized by Congress under the Omnibus Public Lands Act of 2009. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Of the 946 previously recorded sites identified in the study corridor, 107 sites do not meet the criteria for eligibility for listing in the NRHP and, therefore, have been evaluated as not eligible sites; 119 sites have been evaluated as eligible for inclusion in the NRHP. Eligibility for inclusion in the NRHP was not evaluated for 697 sites. Five cultural resources are listed in the NRHP. The remaining 18 resources represent multiple contributing segments of two significant linear sites (Oregon NHT and Goodale's Cutoff Study Trail). NRHP-listed properties include the Administration Building, Eastern Oregon State College (Oregon), the Oregon Commercial Company Building (Oregon), the Well Spring Segment of the Oregon NHT (Oregon), Bernard's Ferry (Idaho), and the Poison Creek Stage Station (Idaho). These results are summarized in Table 3-439. The relatively large number of unevaluated sites in Oregon is due to the Oregon SHPO requiring presence or absence testing to support whether a site is or is not eligible under each of the four NRHP criteria. In Idaho it is likely the SHPO requested that additional

investigations be conducted in order to justify a determination of eligibility. For the purpose of this cultural analysis, all unevaluated sites are treated as eligible for inclusion in the NRHP.

Based on RLS cultural data, resources identified within 5 miles of the study corridor that potentially would be affected visually include Signature Rock (Oregon), the Virtue Flat Mining Area (Oregon), the Vale Irrigation District (Oregon), the Owyhee Dam Historic District ([NRHP-listed] Oregon), Statewide Planning Goal 5 Resources (Oregon), the Oregon NHT and other historic transportation corridors, and places that are important to Native American tribes. Goal 5 resources may include sites, structures, or districts. Additional resources include numerous historic buildings, structures, waterworks, and historic transportation corridors associated with the community of La Grande, the La Grande Commercial Historic District (NRHP-listed), the Baker City Historic District (NRHP-listed), and the Huntington Survey District. The latter includes a group of late nineteenth to early twentieth century structures thematically related to early community development in the area (Tetra Tech 2014). The Map Rock Petroglyph Historic District (NRHP-listed) and the Givens Hot Springs area also are located in the vicinity of the study corridor (southern end). There are several historic sites associated with the Oregon NHT, including the aforementioned Givens Hot Springs.

Places important to Native American tribes are located throughout the study corridor. Cultural resources include numerous archaeological sites (e.g., rock features, human burial sites, habitation structures, lithic procurement areas), historic trails, historic properties of religious and cultural significance to Indian tribes, and significant geographic features. For information regarding Native American concerns, refer to Section 3.2.14.

SEGMENT 1—MORROW-UMATILLA

There are 122 previously recorded sites along Segment 1; these include 27 pre-contact sites, 92 historic sites, and 3 multi-component sites (pre-contact and historic components). Of these sites, 20 are eligible for inclusion in the NRHP, 24 are not eligible, and 74 have not been evaluated. One cultural resource (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three resources represent multiple contributing segments of the Oregon NHT. These results are summarized in Table 3-440, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Table 3-440. Summary of Cultural Resources Inventory Data for Segment 1—Morrow to Umatilla

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]												
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of the Oregon National Historic Trail[2]	NRHP-listed Properties	Total Number of Previously Recorded Sites	National Historic Trails[3]	Total Number of Sites in the Direct Effects Area of Potential Effects
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component					
Applicant's Proposed Action	6	10	0	1	20	0	17	41	2	3	1	101	1	11
Variation S1-B1	*3*	*7*	*0*	*1*	*9*	*0*	*13*	*21*	*2*	*2*	*0*	*58*	*1*	*0*
Variation S1-B2	*3*	*7*	*0*	*0*	*9*	*0*	*11*	*21*	*2*	*2*	*0*	*55*	*1*	*1*
East of Bombing Range Road	7	10	0	1	19	0	17	41	2	3	1	101	1	12
Applicant's Proposed Action – Southern Route	6	10	0	1	21	0	18	41	2	3	1	103	1	8
West of Bombing Range Road – Southern Route	6	9	0	1	20	0	18	38	2	2	1	97	1	8
Longhorn	4	8	0	1	12	0	15	35	2	4	0	81	1	10
Interstate 84	4	11	0	1	12	0	15	41	3	2	0	89	1	9
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0*[4]	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0*[4]	*0*
Interstate 84 – Southern Route	4	11	0	1	13	0	16	42	3	2	0	92	1	6

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[3]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

[4]There are no previously recorded segments of the Oregon National Historic Trail along Variations S1-A1 and S1-A2; however, unrecorded segments of the trail crossed the route variations (refer to map MV-25 for inventory data).

NRHP = National Register of Historic Places

Numerous significant cultural resources are present in Segment 1; these include one pre-contact human burial site (including funerary objects), pre-contact and historic cairns, pre-contact and historic rock alignments, pre-contact lithic procurement areas, the Old U.S. 30/Columbia River Highway, the West Extension Irrigation Canal, the Well Spring Segment of the Oregon NHT, the Lower Well Springs

Diversion of the Well Spring Segment of the Oregon NHT, and trail-associated sites. Additional resources include the NWSTF Boardman and associated sites, the Umatilla Army Ordinance Depot, and sites/areas of Native American concern (e.g., historic properties of religious and cultural significance to Indian tribes, Sand Hollow Battlefield 1848, McKay Creek area, Butter Creek, Birch Creek [refer to Section 3.2.14]). Two historic properties of religious and cultural significance to the CTUIR were identified in the NWSTF Boardman. These cultural resources were referred to as "TCPs" in the NWSTF Boardman Final EIS (Navy 2015). For consistency with this B2H Project EIS, in Sections 3.2.13 and 3.2.14, the term "historic properties of religious and cultural significance to Indian tribes" will be used instead to describe these resources that are specifically of significance to Native American tribes.

Two Study Trails— the Upper Columbia River Route Study Trail and the Umatilla River Route and Columbia River to The Dalles Study Trail—were found in association with Segment 1.

Based on RLS cultural data, resources identified within 5 miles of Segment 1 that potentially would be affected visually, include the Oregon NHT and numerous buildings and structures, waterworks, and historic transportation corridors (trail, road, and railroad segments) associated with the communities of Boardman, Echo, and Pilot Rock.

Applicant's Proposed Action Alternative

Cultural Resources Site Data

A total of 101 previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 24 pre-contact sites, 75 historic sites, and 2 multi-component sites (Table 3-440). Of these sites, 16 are eligible for inclusion in the NRHP, 21 are not eligible, and 60 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT. Eleven sites were identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, cairns, one habitation site (pithouses), one campsite, one artifact scatter, and one culturally modified trees (bark-peeled ponderosa trees) locale. Historic site types include artifact scatters, isolated structures and features (e.g., hearth, cairn, rock alignment, and unknown foundation), habitation structures (farming/ranching-related sites), campsites, homesteads, military facilities, sawmills, waterworks (well, reservoir, and undetermined water control feature), one cistern, one survey marker, one abandoned communication facility, one pioneer grave site, and multiple historic linear sites (telephone line, canal, ditch, trail, road, and railroad segments). Multi-component site types consist of one pre-contact ceramic scatter/historic artifact scatter and the Logging Railway Network/pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

The Logging Railway Network, the Railroad Mill Spurline, the Old U.S. 30/Columbia River Highway, the West Extension Irrigation Canal, the Oregon NHT/Interpretative Park-California Gulch, and multiple segments of the Oregon NHT are located along this alternative route. The Applicant's Proposed Action

Alternative crosses the West Extension Irrigation Canal and the NRHP-listed Well Spring Segment of the Oregon NHT (Links 1-3 and 1-27, respectively). Five additional sites are crossed by this alternative route (2 roads, 1 unnamed trail, 1 ditch, and 1 water control feature).

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), and undocumented historic transportation corridors along Link 1-63.

The Applicant's Proposed Action Alternative (Link 1-27) encroaches on the eastern portion of the NWSTF Boardman. This facility contains several cultural resources and encompasses a 47,432-acre area (Navy 2015). Cultural resources include numerous historic buildings and structures, six historic artifact scatters and structural sites, two wagon roads, the Well Spring Segment of the Oregon NHT, the Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT, and several trail-associated sites (Navy 2015). Only five of these resources (three historic artifacts scatters and two trail segments) are located in the study corridor. Two historic properties of religious and cultural significance to Indian tribes (referred to as TCPs by the Navy) also were identified in the NWSTF Boardman (direct and indirect effects APEs). These NRHP-eligible resources have been identified as being important to the CTUIR (refer to Section 3.2.14).

The Applicant's Proposed Action Alternative passes through a cultural landscape in the McKay Creek area at Link 1-63, east of U.S. 395 in Umatilla County. The McKay Creek area is important for both pre-contact and historic resources (including historic transportation corridors) and is a place of importance in the contemporary culture of the CTUIR. The CTUIR has identified this area as a "cultural landscape." Additional resources have been identified as being important to Native American tribes along this alternative route. These include Sand Hollow Battlefield 1848, sites near Pilot Rock, and unspecified sites (Ethnographic studies). For resources of Native American concern, refer to Section 3.2.14.

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually, along this alternative route, include the Oregon NHT, waterworks, residential and commercial buildings, and historic transportation corridors (including a segment of the OR&N).

National Historic Trails/Potential National Historic Trails

One segment of the Oregon NHT, the Well Spring Segment, is located in the direct effects APE, and is crossed by the Applicant's Proposed Action Alternative (Link 1-27) to the east/southeast of Juniper Canyon (immediately east of NWSTF Boardman). The trail segment is listed in the NRHP under Criterion A (Hicks 1995). The Well Spring Segment of the Oregon NHT (Lower Well Springs Diversion) has been identified in the indirect effects APE, approximately 1 mile west of Link 1-27. The Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT has been recommended eligible for the NRHP because of its association with the Oregon NHT (Navy 2015:3.10.12). Unrecorded, intact segments of the Oregon NHT occur along Link 1-27 in the indirect effects APE (refer to map MV-25 for inventory data).

The eastern portion of the Applicant's Proposed Action Alternative (Links 1-65, 1-71, and 1-77) parallels the Oregon NHT for approximately 8 miles (between 0.7 and 1.3 miles apart) northwest of the Blue

Mountain Crossing in Union County. There, the trail roughly follows the I-84 corridor before heading southeast toward the Hilgard area. The portion of the trail that parallels Link 1-65 and Link 1-71 has been evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. The following trail-associated sites are located along the Applicant's Proposed Action Alternative, in the indirect effects APE: Well Spring (west of NWSTF Boardman), Sand Hollow Battlefield 1848, Pioneer Campsite (near California Gulch), and Blue Mountain Crossing.

The Lewis and Clark NHT has been identified in the vicinity of the Applicant's Proposed Action Alternative near Boardman, along the Columbia River (approximately 2.2 miles to the northwest of Link 1-1).

Based on NPS data, two Study Trails were found in association with the Applicant's Proposed Action Alternative; these are the Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles. Similar to the description for the Lewis and Clark NHT, segments of the Study Trails (closest distance) are located near Boardman, along the Columbia River (northwest of Link 1-1), in the vicinity of the study corridor (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-B1

Fifty-eight previously recorded sites have been identified along Variation S1-B1, including 17 pre-contact sites, 39 historic sites, and 2 multi-component sites (Table 3-440). Of these sites, 10 are eligible for inclusion in the NRHP, 10 are not eligible, and 36 have not been evaluated. The remaining two resources represent multiple contributing segments of the Oregon NHT. No previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, one cairn site, one artifact scatter, one lithic procurement area, one culturally modified trees (bark-peeled ponderosa trees) locale, and one habitation site (pithouses). Historic site types include isolated features (hearth and rock alignment), habitation structures, homesteads, military facilities, campsites, railroad camps, sawmills, artifact scatters, one communication facility, one pioneer grave site, one open well, and several historic linear sites (railroad and trail segments). Multi-component site types include one pre-contact ceramic scatter/historic artifact scatter and the Logging Railway Network/pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, and historic habitation structures (farming/ranching-related sites).

The Railroad Mill Spurline is located in the indirect effects APE. There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), as well as undocumented historic transportation corridors.

Two previously recorded, contributing segments of the Oregon NHT are located approximately 0.7 mile east of Variation S1-B1, in the indirect effects APE (refer to map MV-25 for inventory data). Variation S1-B1 parallels unrecorded, intact segments of the Oregon NHT for approximately 5 miles northwest of the Blue Mountain Crossing in Union County. The Oregon NHT/Interpretative Park-California Gulch and

the Blue Mountain Crossing Interpretive Park site are located in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-B2

Fifty-five previously recorded sites have been identified along Variation S1-B2, including 14 pre-contact sites, 39 historic sites, and 2 multi-component sites (three fewer sites than Variation S1-B1) (Table 3-440). Sites identified along Variation S1-B1, but not along Variation S1-B2, include three pre-contact sites (lithic and tool scatters and lithic scatter). The differences in the number of sites occur along Link 1-75. Variation S1-B2 is located farther from previously recorded sites than Variation S1-B2. Only one site was identified in the direct effects APE.

Variation S1-B2 is closer to the Oregon NHT (previously recorded, contributing segment) than Variation S1-B1. The historic trail is located in the indirect effects APE. Trail-associated sites identified along this route variation are the same as those identified along Variation S1-B1, since the two route variations roughly follow similar alignments in proximity to the trail (refer to Section 3.2.15).

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Thirty-five previously recorded sites have been identified along Design Option 1, including 11 pre-contact sites and 24 historic sites. Of these sites, 6 are eligible for inclusion in the NRHP, 8 are not eligible, and 19 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. Three previously recorded sites were identified in the direct effects APE.

Pre-contact site types include lithic scatters, campsites, lithic and tool scatter, one lithic procurement area, one cairn, and one midden deposit. Historic site types include artifact scatters, homesteads, waterworks (reservoir), one foundation, one military observation station, one survey marker, and multiple historic linear sites (canal, trail, road, and railroad segments).

The Old U.S. 30/Columbia River Highway, the West Extension Irrigation Canal, the Oregon NHT/Interpretative Park-California Gulch, and the Well Spring Segment of the Oregon NHT are located along this design option. Design Option 1 crosses the West Extension Irrigation Canal (contributing segment) and the Well Spring Segment of the Oregon NHT. The Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT has been identified in the indirect effects APE, approximately 1 mile west of the Bombing Range Road.

Design Option 1 also is in proximity to the NWSTF Boardman and associated sites (e.g., historic buildings, structures, historic artifact scatters, and two historic properties of religious and cultural significance to Indian tribes). The two historic properties of religious and cultural significance to Indian tribes are located in the direct and indirect effects APEs. An additional resource (Sand Hollow Battlefield 1848) has been identified as being important to Native American tribes along Design Option 1.

The Lewis and Clark NHT is located in the vicinity of the study corridor (northern end of the design option). The Upper Columbia River Route Study Trail and the Umatilla River Route and Columbia River

to The Dalles also are located in the vicinity of the study corridor (refer to map MV-26 for inventory data).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, resources that potentially would be affected visually, along this design option, include numerous historic residential buildings, commercial buildings, and historic transportation corridors (including the OR&N).

Design Option 2

Although Design Options 2 and 1 do not share the same alignment, they are in proximity to one another, and the same previously recorded sites are identified for both design options. Like Design Option 1, Design Option 2 crosses the NRHP-listed Well Spring Segment of the Oregon NHT.

Based on the proximity of Design Option 2 to areas with RLS cultural data, resources that potentially would be affected visually along this design option are the same as those identified along Design Option 1. Both Design Option 2 and Design Option 1 follow similar alignments, passing in proximity to the same resources.

Design Option 3

Although Design Options 3 and 1 do not share the same alignment, they are in proximity to one another, and the same previously recorded sites are identified for both design options. Like Design Option 1, Design Option 3 crosses the NRHP-listed Well Spring Segment of the Oregon NHT.

Based on the proximity of the design option to areas with RLS cultural data, resources that potentially would be affected visually along this design option are the same as those identified along Design Option 1. Both Design Option 3 and Design Option 1 follow similar alignments, passing in proximity to the same resources.

East of Bombing Range Road Alternative

Cultural Resources Site Data

A total of 101 previously recorded sites have been identified along the East of Bombing Range Road Alternative, including 25 pre-contact sites, 74 historic sites, and 2 multi-component sites (Table 3-440). Since this alternative route only parallels Bombing Range Road on the east side rather than the west side of the road, the sites identified along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative, except for slight variations in the site types. The East of Bombing Range Road Alternative has one additional pre-contact site (lithic scatter) and one less historic site (artifact scatter) than the Applicant's Proposed Action Alternative. The differences in site type occur along Link 1-25 (south of the Longhorn Substation). Twelve historic sites were identified in the direct effects APE.

Of the 101 previously recorded sites identified along this alternative route, 17 are eligible for inclusion in the NRHP, 20 are not eligible, and 60 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact

lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

Both the East of Bombing Range Road Alternative crosses the West Extension Irrigation Canal (contributing segment) and the NRHP-listed Well Spring Segment of the Oregon NHT (Links 1-3 and 1-25, respectively). Three additional sites are crossed by this alternative route (unnamed road, unnamed ditch, and water control feature).

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), as well as undocumented historic transportation corridors along Link 1-63.

The NWSTF Boardman (west of Link 1-27) and several resources of Native American concern are located along this alternative route. Like the Applicant's Proposed Action Alternative, these resources include two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman, Sand Hollow Battlefield 1848, sites near Pilot Rock, unspecified sites (Ethnographic studies), and the McKay Creek area (refer to Section 3.2.14). Of these resources, the McKay Creek area and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman are located in the direct effects APE. Link 1-63 crosses the McKay Creek area. Of the alternative routes considered under Segment 1, the East of Bombing Range Road Alternative is the closest to Sand Hollow Battlefield 1848 (Native American concern).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not share the same alignment south of the Longhorn Substation, they are in proximity to one another, and the same resources are identified for both alternative routes. Southeast of the NWSTF Boardman, the alternative routes join at Link 1-43, and follow the same alignment.

National Historic Trails/Potential National Historic Trails

The Well Spring Segment of the Oregon NHT is located in the direct effects APE, and is crossed by the alternative route (Link 1-25) to the east/southeast of Juniper Canyon, east of NWSTF Boardman. The Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT has been identified in the indirect effects APE, approximately 0.6 mile west of Link 1-25.

Trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments south of the Longhorn Substation. In addition, segments of the Oregon NHT, identified along the eastern portion of this alternative route (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There, the alternative routes share the same alignment (Links 1-65, 1-71, and 1-77).

Segments of the Lewis and Clark NHT and the two Study Trails (Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles), identified along this alternative route (Link 1-1), are the same as those identified along the Applicant's Proposed Action Alternative, since the

two alternative routes follow similar alignments in proximity to the trails. These historic trails are located in the vicinity of the study corridor (refer to maps MV-25 and MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Applicant's Proposed Action – Southern Route Alternative

Cultural Resources Site Data

A total of 103 previously recorded sites have been identified along the Applicant's Proposed Action – Southern Route Alternative, including 25 pre-contact sites, 76 historic sites, and 2 multi-component sites (two more sites than the Applicant's Proposed Action Alternative) (Table 3-440). Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include one pre-contact site (campsite) and three historic sites (artifact scatters and water control feature). Two historic sites (homestead and ditch) identified along the Applicant's Proposed Action Alternative are not located within the study corridor for the Applicant's Proposed Action – Southern Route Alternative. The differences in the number and type of sites occur along Links 1-66 and 1-83 (Rocky Ridge area). Most of the previously recorded sites occur in the areas where the alignments are shared (from the Longhorn Substation to Pilot Rock and east of Rocky Ridge). Eight historic sites were identified in the direct effects APE.

Of the 103 previously recorded sites identified along this alternative route, 16 are eligible for inclusion in the NRHP, 22 are not eligible, and 61 sites have not been evaluated. One site (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors. This alternative route crosses the Well Spring Segment of the Oregon NHT, two unnamed roads, one unnamed trail, and one water control feature. Based on the Class I literature search, the area east/southeast of Pilot Rock (Rocky Ridge area [Link 1-66]), was found to contain a low density of previously recorded sites.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

The Applicant's Proposed Action – Southern Route Alternative also is in proximity to the NWSTF Boardman and associated sites (west of Link 1-27), as well as several resources that are of interest to Native American tribes (e.g., Sand Hollow Battlefield 1848, sites near Pilot Rock, two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman [refer to Section 3.2.14]). This route avoids the McKay Creek area.

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Applicant's Proposed Action – Southern Route Alternative (Link 1-83) lies slightly farther from resources associated with Pilot Rock. Resources are similar because they occur near the areas where the alignments are shared or intersect.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow the same alignment south of the Longhorn Substation (Link 1-27). In addition, segments of the Oregon NHT, identified along the eastern portion of this alternative route (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes also share the same alignment (Links 1-65, 1-71, and 1-77).

Segments of the Lewis and Clark NHT and the two Study Trails (Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles), identified along this alternative route (Link 1-1), are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes share an alignment in proximity to the trails. These historic trails are located in the vicinity of the study corridor (refer to maps MV-25 and MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

Cultural Resources Site Data

Ninety-seven previously recorded sites have been identified along the West of Bombing Range Road – Southern Route Alternative, including 25 pre-contact sites, 70 historic sites, and 2 multi-component sites (four fewer sites than the Applicant's Proposed Action Alternative) (Table 3-440). Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include one pre-contact site (campsite) and three historic sites (artifact scatters and water control feature). Eight sites identified along the Applicant's Proposed Action Alternative are not located within the study corridor for the West of Bombing Range Road – Southern Route Alternative. These sites include 2 trails, 1 cistern, 1 water control feature, 1 historic artifact scatter, 1 historic cairn, 1 homestead, and 1 ditch. The differences in the number and type of sites occur along Links 1-62, 1-64, and 1-66 (Matlock Canyon and Rocky Ridge areas). Most of the sites are the same because they occur in the areas where the alignments are shared (south of the Longhorn Substation and east of Rocky Ridge). Eight sites were identified in the direct effects APE.

Of the 97 previously recorded sites identified along this alternative route, 15 are eligible for inclusion in the NRHP, 21 are not eligible, and 58 have not been evaluated. One cultural resource (Well Spring Segment of the Oregon NHT) is listed in the NRHP. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites). Based on the Class I literature search, the areas along Matlock Canyon and Rocky Ridge (west/southwest and east/southeast of Pilot Rock), were found to contain a low density of previously recorded sites. However, the proximity to water sources (Butter and Birch creeks) suggests the

potential for undocumented sites (including resources of Native American concern). There also is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

The West of Bombing Range Road – Southern Route Alternative also is in proximity to the NWSTF Boardman and associated sites (west of Link 1-27), as well as several resources that are of interest to Native American tribes (e.g., Sand Hollow Battlefield 1848, Birch Creek, two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman [refer to Section 3.2.14]). This alternative route avoids the McKay Creek area.

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Compared to the Applicant's Proposed Action Alternative, the West of Bombing Range Road – Southern Route Alternative (Link 1-66) lies farther from resources associated with Pilot Rock (approximately 3.8 miles to the south [closest distance]).

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow the same alignment south of the Longhorn Substation (Link 1-27). In addition, segments of the Oregon NHT, identified along the eastern portion of this alternative route (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes also share the same alignment (Links 165, 1-71, and 1-77).

Segments of the Lewis and Clark NHT and the two Study Trails, identified along this alternative route (Link 1-1), are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes share an alignment in proximity to the trails. These historic trails are located in the vicinity of the study corridor (refer to maps MV-25 and MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Additional Action – 69-Kilovolt Line Replacement

The affected environment for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under Applicant's Proposed Action Alternative.

Longhorn Alternative

Cultural Resources Site Data

Eighty-one previously recorded sites have been identified along the Longhorn Alternative, including 20 pre-contact sites, 59 historic sites, and 2 multi-component sites (20 fewer sites than the Applicant's Proposed Action Alternative) (Table 3-440). Sites identified along the Applicant's Proposed Action Alternative, but not along the Longhorn Alternative, include 4 pre-contact sites (lithic scatter, lithic and tool scatter, lithic procurement area, and campsite) and 16 historic sites (artifact scatters, foundation, military observation station, reservoir, survey marker, unnamed road, unnamed ditch, the Well Spring Segment of the Oregon NHT, and the Lower Well Springs Diversion of the Well Spring Segment of the

Oregon NHT). The differences in the number and type of sites occur along Links 1-15 (south of Boardman and west of Finley Buttes). Some of the sites occur in the areas where the alignments are shared (from the Sand Hollow area onto the Wallowa-Whitman National Forest). Ten sites were identified in the direct effects APE.

Of the 81 previously recorded sites identified along this alternative route, 12 are eligible for inclusion in the NRHP, 13 are not eligible, and 52 have not been evaluated. The remaining four cultural resources represent multiple contributing segments of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

The Longhorn Alternative crosses the West Extension Irrigation Canal, one segment of the Oregon NHT (contributing segment), one unnamed ditch, one unnamed road, and one water control feature. Based on the Class I literature search, the area southeast of the Longhorn Substation (Links 1-5 and 1-15) was found to contain a low density of previously recorded sites.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela), and undocumented historic transportation corridors along Link 1-63.

The Longhorn Alternative crosses the McKay Creek area at Link 1-63, east of U.S. 395 in Umatilla County. As previously described for the Applicant's Proposed Action Alternative, the McKay Creek area is important for both pre-contact and historic resources, including historic transportation corridors. This sensitive area also has been identified as being important to Native American tribes. Additional resources have been identified as being important to Native American tribes along this alternative route (e.g., sites near Pilot Rock, Butter Creek [refer to Section 3.2.14). The Longhorn Alternative avoids the Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman and Pilot Rock, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Except for the initial north-south portion exiting the Longhorn Substation, the alternative routes share the same alignment. The Longhorn Alternative (Link 1-9) lies farther from resources associated with Boardman (approximately 0.9 mile to the east [closest distance]).

National Historic Trails/Potential National Historic Trails

One previously recorded, contributing segment of the Oregon NHT is in the direct effects APE, and is crossed by this alternative route (Link 1-15) to the west of Sand Hollow in Morrow County. Unrecorded, intact segments of the Oregon NHT occur along Link 1-15 in the indirect effects APE (refer to map MV-25 for inventory data). Segments of the Oregon NHT, located along the eastern portion of the Longhorn Alternative (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes share the same alignment (Links 1-65, 1-71, and 1-77). The following trail-associated sites are located along the Longhorn Alternative in the indirect effects APE: Pioneer Campsite (near California Gulch) and the Blue Mountain Crossing.

Segments of the Lewis and Clark NHT, and the two Study Trails (Upper Columbia River Route and the Umatilla River Route and Columbia River to The Dalles), identified along this alternative route (Link 1-5), are the same as those identified along the Applicant's Proposed Action Alternative. Segments of the trails are the same because they occur near the area where the alternative routes originate (Longhorn Substation).These historic trails are located in the vicinity of the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Interstate 84 Alternative and Variations

Cultural Resources Site Data

Eighty-nine previously recorded sites have been identified along Interstate 84 Alternative, including 20 pre-contact sites, 66 historic sites, and 3 multi-component sites (12 fewer sites than the Applicant's Proposed Action Alternative) (Table 3-440). Of these sites, 15 are eligible for inclusion in the NRHP, 13 are not eligible, and 59 have not been evaluated. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. Nine historic sites were identified in the direct effects APE.

Of the 89 previously recorded sites identified along the Interstate 84 Alternative, 75 sites occur in those areas where the alternative route and the Applicant's Proposed Action Alternative share the same alignment (east of Pilot Rock) or become closer to one another. Based on the Class I literature search, the area east/southeast of the Longhorn Substation (from the Umatilla Army Ordinance Depot to Reith) was found to contain a low density of previously recorded sites (western and central extent of the Interstate 84 Alternative).

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic and artifact scatters, one lithic procurement area, one cairn site, one culturally modified trees (bark-peeled ponderosa trees) locale, one habitation (pithouses), and one human burial site (funerary objects). Historic site types include artifact scatters, cairns and rock alignments, campsites, habitations, homesteads, one isolated feature (hearth), one water control feature, sawmills, military facilities, one communication facility, one pioneer grave, the Oregon NHT/Interpretative Park-California Gulch, and multiple historic linear sites (canal, ditch, railroad, trail, and road segments). Multi-component site types include one pre-contact ceramic scatter/historic artifact scatter, the possible location of Fort Henrietta/pre-contact lithic scatter, and the Logging Railway Network/pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, historic habitation structures (farming/ranching-related sites), and historic transportation corridors.

The Railroad Mill Spurline, the West Extension Irrigation Canal, the Hunt Ditch, the Courtney Ditch Lateral, the U.S. Feed Canal, the Old U.S. 30/Columbia River Highway, the Oregon NHT, and several "Indian Trails" are located along this alternative route. The Interstate 84 Alternative crosses the West Extension Irrigation Canal, the Hunt Ditch, and the Courtney Ditch Lateral. Two additional sites are crossed by this alternative route (unnamed ditch and unnamed road). The Interstate 84 Alternative crosses one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data).

There also is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and southeast of Kamela (Link 1-77), along with the potential for significant, pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

Cultural resources associated with the Umatilla Army Ordinance Depot were identified along the northeastern end of this alternative route. This facility is located west of Hermiston, approximately 0.1 mile north of Link 1-23, in the indirect effects APE. The Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

The Interstate 84 Alternative passes through the McKay Creek area at Link 1-63, east of U.S. 395 in Umatilla County. This sensitive area also has been identified as being important to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, Echo, and Pilot Rock, resources that potentially would be affected visually, along this alternative route, include numerous residential and commercial buildings, waterworks, and historic transportation corridors (including a segment of the OR&N).

National Historic Trails/Potential National Historic Trails

The Interstate 84 Alternative (Link 1-31) crosses one unrecorded segment (unknown condition) of the Oregon NHT at I-84, approximately 2.9 miles west/northwest of Rieth (refer to map MV-25 for inventory data). Segments of the Oregon NHT, located along the eastern portion of the Interstate 84 Alternative (northeast of Blue Mountain), are the same as those identified along the Applicant's Proposed Action Alternative. There the alternative routes share the same alignment (Links 1-65, 1-71, and 1-77).

There is the potential for undocumented, trail-associated sites to occur in the Echo area (Link 1-31) in Umatilla County. The following trail-associated sites have been identified along the Interstate 84 Alternative, in the indirect effects APE: Possible Fort Henrietta, Echo-Indian Agent Home, Echo-Pioneer Campsite, Pioneer Campsite (near California Gulch), and the Blue Mountain Crossing.

Segments of the Lewis and Clark NHT, the Upper Columbia River Route Study Trail, and the Umatilla River Route and Columbia River to The Dalles Study Trail have been identified approximately 2.3 miles to the northeast of Link 1-5 near Boardman along the Columbia River (refer to maps MV-25 and MV-26 for inventory data). Farther east, the historic trails also follow the Columbia River corridor (north of Irrigon and Umatilla) and lie approximately 5.7 miles north/northeast of Link 1-19 (closest distance), outside of the study corridor. Additional segments of the Umatilla River Route and Columbia River to The Dalles Study Trail are located in the direct effects APE, just south of Stanfield Junction, between Stanfield and Echo (refer to map MV-26 for inventory data). Segments of this Study Trail have not been documented in or near the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-A1

Six previously recorded sites have been identified along Variation S1-A1, including 1 pre-contact site, 4 historic sites, and 1 multi-component site (Table 3-440). Eligibility for inclusion in the NRHP was not evaluated for these sites. Variation S1-A1 is closer to previously recorded sites than Variation S1-A2. No previously recorded sites were identified in the direct effects APE.

Site types include one pre-contact human burial site (burial goods), several "Indian Trails," and the possible location of Fort Henrietta/pre-contact lithic scatter.

Variation S1-A1 crosses one unrecorded segment (unknown condition) of the Oregon NHT at I-84, approximately 2.9 miles west/northwest of Rieth (refer to map MV-25 for inventory data). From this point, the trail roughly parallels the Umatilla River and a railroad corridor (from Echo to Rieth). There is the potential for undocumented, trail-associated sites to occur along this route variation near the Echo area. The following trail-associated sites have been identified along Variation S1-A1, in the indirect effects APE: Possible Fort Henrietta, Echo-Indian Agent Home, and Echo-Pioneer Campsite. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S1-A2

Previously recorded sites identified along Variation S1-A2 are the same as those identified along Variation S1-A1 (Table 3-440). Sites are the same because they occur near an area where the route variations intersect (Echo area, just west of Link 1-37). No previously recorded sites were identified in the direct effects APE.

Variation S1-A2 crosses one unrecorded segment (unknown condition) of the Oregon NHT (refer to map MV-25 for inventory data). One unrecorded, intact segment of the Oregon NHT is in proximity to Link 1-37 (indirect effects APE). There is the potential for undocumented, trail-associated sites to occur along this route variation in or near the Echo and Nolin areas in Umatilla County.

Interstate 84 – Southern Route Alternative

Cultural Resources Site Data

Ninety-two previously recorded sites have been identified along the Interstate 84 – Southern Route Alternative, including 21 pre-contact sites, 68 historic sites, and 3 multi-component sites (three more sites than the Interstate 84 Alternative) (Table 3-440). Because the affected environment for the Interstate 84 – Southern Route Alternative would be similar to the Interstate 84 Alternative, these two alternative routes are compared.

Sites identified along the Interstate 84 – Southern Route Alternative, but not along the Interstate 84 Alternative, include one pre-contact site (campsite) and three historic sites (artifact scatters and water control feature). One historic site (homestead) identified along the Interstate 84 Alternative is not located within the study corridor for the Interstate 84 – Southern Route Alternative. The differences in the number and type of sites occur along Links 1-66 and 1-83 (Rocky Ridge area). Most of the previously recorded sites occur in the areas where the alignments are shared (form the Longhorn

Substation [to the east/southeast] to Pilot Rock, and east of Rocky Ridge). Six sites were identified in the direct effects APE.

Of the 92 previously recorded sites identified along this alternative route, 15 are eligible for inclusion in the NRHP, 14 are not eligible, and 61 have not been evaluated. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. The Interstate 84 – Southern Route Alternative crosses the same sites as the Interstate 84 Alternative, except for one less site (unnamed ditch). The Interstate 84 – Southern Route Alternative also crosses one unrecorded segment (unknown condition) of the Oregon NHT (refer to map MV-25 for inventory data). Based on the Class I literature search, the area east/southeast of the Longhorn Substation (from the Umatilla Army Ordinance Depot to Reith) was found to contain a low density of previously recorded sites.

There is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and south east of Kamela (Link 1-77), along with the potential for significant pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

As described for the Interstate 84 Alternative, the Umatilla Army Ordinance Depot also is a significant resource identified along the Interstate 84 – Southern Route Alternative. This facility is located approximately 0.1 mile north of Link 1-23, in the indirect effects APE. The Interstate 84 – Southern Route Alternative avoids the McKay Creek area, the Sand Hollow Battlefield 1848, and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

Based on RLS cultural data collected for alternative routes in the vicinity of Boardman, Echo, and Pilot Rock, resources that potentially would be affected visually along this alternative route are the same as those identified along the Interstate 84 Alternative. Both the Interstate 84 Alternative and the Interstate 84 – Southern Route Alternative share the same alignment, passing in proximity to the same resources (from the Longhorn Substation [to the east-southeast] to Pilot Rock).

National Historic Trails/Potential National Historic Trails

Segment of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Interstate 84 Alternative, since the two alternative routes follow the same alignment east of the Longhorn Substation and east of Rocky Ridge. This alternative route crosses the same unrecorded, segment (unknown condition) of the trail as the Interstate 84 Alternative (refer to map MV-25 for inventory data).

Segments of the Lewis and Clark NHT and the two Study Trails (Upper Columbia River Route Study Trail and Umatilla River Route and Columbia River to The Dalles Study Trail), identified along this alternative route, are the same as those identified along the Interstate 84 Alternative. This alternative route also crosses the Umatilla River Route and Columbia River to The Dalles (refer to map MV-26 for inventory data). Segments of this Study Trail have not been documented in or near the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 2—BLUE MOUNTAINS

There are 133 previously recorded sites along Segment 2; these include 59 pre-contact sites, 60 historic sites, 12 multi-component sites (pre-contact and historic components), and 2 sites of unknown temporal affiliation. Of these sites, 13 are eligible for inclusion in the NRHP, 18 are not eligible, and 99 have not been evaluated. One cultural resource (Administrative Building, Eastern Oregon State College [La Grande]) is listed in the NRHP. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. These results are summarized in Table 3-441, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 2; these include one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation), pre-contact and historic cairns, pre-contact rock alignments, pre-contact lithic procurement areas, the Hilgard Cemetery, pioneer graves, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites (including Hilgard Junction and Clover Creek Station), and the Mount Emily Lumber Company Railroad. A number of historic habitation structures (farming/ranching-related sites), trails/wagon roads, railroads, and mine-related sites also are present along Segment 2. There is the potential for undocumented, significant sites in the Ladd Marsh Wildlife Area.

Based on RLS cultural data, resources identified within 5 miles of Segment 2 that potentially would be affected visually include numerous residential and commercial buildings, waterworks, and historic transportation corridors (trails, roads, and railroad segments) associated with the community of North Powder, La Grande, and the La Grande Commercial Historic District.

Table 3-441. Summary of Cultural Resources Inventory Data for Segment 2—Blue Mountains

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	2	7	3	2	11	0	42	27	6	2	1	0	103	1	8
Variation S2-A1	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*1*
Variation S2-A2	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*26*	*1*	*2*
Variation S2-B2	*0*	*1*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*27*	*1*	*1*

Table 3-441. Summary of Cultural Resources Inventory Data for Segment 2—Blue Mountains

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Variation S2-C1	*0*	*0*	*2*	*1*	*3*	*0*	*7*	*2*	*4*	*0*	*0*	*0*	*19*	*0*	*0*
Variation S2-C2	*0*	*0*	*2*	*2*	*4*	*0*	*7*	*6*	*4*	*0*	*0*	*0*	*25*	*0*	*1*
Variation S2-E1	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*6*	*0*	*0*
Variation S2-E2	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*7*	*1*	*1*
Variation S2-F1	*0*	*1*	*2*	*1*	*4*	*0*	*18*	*4*	*0*	*2*	*0*	*0*	*32*	*0*	*2*
Variation S2-F2	*0*	*1*	*2*	*3*	*5*	*0*	*24*	*4*	*2*	*2*	*0*	*0*	*43*	*0*	*0*
Glass Hill	2	7	3	2	11	0	37	25	5	2	1	0	95	1	8
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	2	8	3	5	11	0	51	34	9	2	2	1	128	1	5

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

NRHP = National Register of Historic Places

Applicant's Proposed Action Alternative

Cultural Resources Site Data

A total of 103 previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 46 pre-contact sites, 46 historic sites, 9 multi-component sites, and 2 sites of unknown temporal affiliation (Table 3-441). Of these sites, 13 are eligible for inclusion in the NRHP, 13 are not eligible, and 77 have not been evaluated. Eight sites were identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, cairns, rock alignments, and habitation (pithouses). Historic site types include artifact scatters, isolated features (e.g., hearth, cairn, and rock alignment), buildings, campsites, homesteads and habitation structures (farming/ranching-related sites), sawmills, mines, water control features/structures, one work camp

(Hilgard Civilian Conservation Corps Camp), one cemetery (Hilgard), one pioneer grave site, one station (Clover Creek Station of the Oregon NHT), one Oregon NHT marker, one spring development, and multiple historic linear sites (railroad, trail, and road segments). Multi-component site types include pre-contact lithic scatters/historic habitation structures (farming/ranching-related sites), pre-contact lithic procurement area/homestead, the Logging Railway Network/pre-contact lithic scatter, pre-contact artifact scatters/historic artifact scatters, pre-contact campsite/homestead, and one pre-contact lithic scatter/homestead and grave site. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites).

The Mount Emily Lumber Company Railroad, the Railroad Mill Spurline, the Logging Railway Network, and the Oregon NHT are located along this alternative route. The Applicant's Proposed Action Alternative crosses the Mount Emily Lumber Company Railroad and one homestead. This alternative route crosses one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data).

There is the potential for direct effects on undocumented, mining-related sites along this route (west of La Grande). In addition, there is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder and La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually, along this alternative route, include residential and commercial buildings, waterworks, and historic transportation corridors. Links 2-35 and 2-45 are located approximately 3 miles to the southwest of La Grande, and approximately 3.6 miles to the southwest of de La Grande Commercial Historic District (Link 2-45). The Applicant's Proposed Action Alternative (Link 2-95) lies approximately 3 miles away from the nearest resources associated with North Powder.

National Historic Trails/Potential National Historic Trails

The Whiskey Creek Segment of the Oregon NHT has been documented along the Applicant's Proposed Action Alternative, approximately 0.9 mile to the east from Link 2-5, southwest of Hilgard. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded, intact segments of the Oregon NHT also have been identified in the indirect effects APE to the southwest of Link 2-5, in the Hilgard area (refer to map MV-25 for inventory data). The Applicant's Proposed Action Alternative (Link 2-75) crosses one unrecorded segment (unknown condition) of the Oregon NHT running alongside I-84, just southwest of Union. This segment of the trail traverses the Clover Creek Valley to North Powder.

The following trail-associated sites are located along the Applicant's Proposed Action Alternative, in the indirect effects APE: Pioneer Spring and Hilgard Junction (Hilgard area); Emily Doone (1868) Grave, Stone Marker, and Oregon NHT Monument (west of La Grande); Possible Pioneer Graves and D. Dodge 1885 Inscription (southwest of Craig Mountain); and Clover Creek Station (northern end of Clover Creek Valley). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-A1

Forty-seven previously recorded sites have been identified along Variation S2-A1, including 18 pre-contact sites, 27 historic sites, and 2 multi-component sites (Table 3-441). Of these sites, 8 are eligible for inclusion in the NRHP, 4 are not eligible, and 35 have not been evaluated. Only one site was identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, one habitation (pithouses), and one cairn site. Historic site types include artifact scatters, campsite, habitations, isolated features (rock alignment and hearth), one open well, one sawmill, one rock alignment, one cemetery (Hilgard), and railroads (Mount Emily Lumber Company Railroad and Railroad Mill Spurline). Multi-component site types include one pre-contact ceramic scatter/historic artifact scatter and the Logging Railway Network/pre-contact lithic scatter. This route variation crosses one pre-contact lithic scatter. The most commonly represented site types are pre-contact lithic scatters and historic habitation structures (farming/ranching-related sites).

Unrecorded, intact segments of the Oregon NHT have been identified in the indirect effects APE, east of Link 2-5 northeast of Hilgard (refer to map MV-25 for inventory data). One trail-associated site (Hilgard Junction) has been identified along Variation S2-A1, in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-A2

Previously recorded sites identified along Variation S2-A2 are the same as those identified along Variation S2-A1 because they occur in an area where the two route variations become closer to one another (0.3 miles apart) or intersect (Table 3-441). Variation S2-A2 is located farther from previously recorded sites than Variation S2-A1. No previously recorded sites have been identified in the direct effects APE.

Variation S2-A2 is located farther from unrecorded, intact segments of the Oregon NHT than Variation S2-A1. The trail-associated site (Hilgard Junction) identified along this route variation is the same as that identified along Variation S2-A1. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented historic transportation corridors along this route variation.

Variation S2-B1

Twenty-six previously recorded sites have been identified along Variation S2-B1, including 14 pre-contact sites, 8 historic sites, and 4 multi-component sites (Table 3-441). Of these sites, 2 are eligible for inclusion in the NRHP, 1 is not eligible, and 24 have not been evaluated. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types are lithic scatters and lithic and tool scatter. Historic site types include habitations, one cairn, one pioneer grave site, one spring development, one trail-associated marker, and two historic linear sites (Mount Emily Lumber Company Railroad and the Oregon NHT). Multi-

component site types include one pre-contact campsite/homestead, pre-contact lithic and tool scatter/historic artifact scatter, pre-contact lithic scatter/spring house, and pre-contact lithic scatters/historic habitation. The most commonly represented site type is pre-contact lithic scatter.

Variation S2-B1 parallels the Oregon NHT for its entirety. The Whiskey Creek Segment of the Oregon NHT has been documented along Variation S2-B1 approximately 1 mile east from the centerline, to the south of Hilgard. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded, intact segments of the Oregon NHT also have been identified in the indirect effects APE, west of La Grande (refer to map MV-25 for inventory data). The following trail-associated sites have been identified along this route variation, in the indirect effects APE: Emily Doone (1868) Grave, Stone Marker, Oregon NHT Monument, and Hilgard Junction. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, mining-related sites along this route variation.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually, along this route variation, include residential and commercial buildings, waterworks, and historic transportation corridors.

Variation S2-B2

Twenty-seven previously recorded sites have been identified along Variation S2-B2, including 14 pre-contact sites, 9 historic sites, and 4 multi-component sites (one additional site than Variation S2-B1) (Table 3-441). The site identified along Variation S2-B2, but not along Variation S2-B1, is a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation). This resource is in the indirect effects APE. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along this route variation, are the same as those identified along Variation S2-B1, since the two route variations follow similar alignments in proximity to the trail (0.4 miles apart). However, Variation S2-B2 is closer to the Oregon NHT (Whiskey Creek Segment) than Variation S2-B1 (indirect effects APE). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually along this route variation are the same as those identified along Variation S2-B1. Resources are the same because they occur near an area where the route variations intersect (east/northeast of Sheep Creek).

Variation S2-C1

Nineteen previously recorded sites have been identified along Variation S2-C1, including 8 pre-contact sites, 5 historic sites, and 6 multi-component sites (Table 3-441). Of these sites, 2 are eligible for inclusion in the NRHP, 4 are not eligible, and 13 have not been evaluated. No previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and one lithic and tool scatter. Historic site types include mines, one pioneer grave site, and one spring development. Multi-component site types include pre-contact lithic scatters/historic habitations, one pre-contact campsite/homestead, one pre-contact lithic and tool scatter/historic artifact scatter, and one pre-contact lithic procurement/homestead. The most commonly represented site type is pre-contact lithic scatter.

One unrecorded, intact segment of the Oregon NHT is located approximately 0.9 mile east of the western end of Variation S2-C1 (Link 2-45) just west of Morgan Lake in Union County (refer to map MV-25 for inventory data). Farther east, the Oregon NHT follows the southern portion of the Grande Ronde Valley, and lies approximately 2.5 miles northeast of the route variation, outside of the study corridor. Two trail-associated sites (D. Dodge 1885 Inscription and Possible Pioneer Graves) have been identified along this route variation, in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, mining-related sites along this route variation.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually, along this route variation, include residential and commercial buildings, waterworks, and historic transportation corridors. Links 2-45 (northern portion of the route variation) is located approximately 3 miles to the southwest of the La Grande Commercial Historic District.

Variation S2-C2

Twenty-five previously recorded sites have been identified along Variation S2-C2, including 9 pre-contact sites, 10 historic sites, and 6 multi-component sites (six more sites than Variation S2-C1) (Table 3-441). Site types identified along Variation S2-C2, but not along S2-C1 include one pre-contact site (lithic scatter) and five historic sites (artifact scatters, stone fences, and cairn). The differences in the number and type of sites occur primarily along the southwestern portion of the route variation (Ladd Marsh Wildlife Area). Only one previously recorded site has been identified in the direct effects APE.

Variation S2-C2 is closer to unrecorded, intact segments of the Oregon NHT than Variation S2-C1. These trail segments are located in the indirect effects APE (refer to map MV-25 for inventory data). Two trail-associated sites (D. Dodge 1885 Inscription and Possible Pioneer Graves) have been identified along this route variation, in the indirect effects APE. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, significant sites in the Ladd Marsh Wildlife Area (east of the route variation), along with the potential undocumented, mining-related sites south of Morgan Lake.

Based on RLS cultural data collected for alternative routes in the vicinity of La Grande, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S2-C1. Resources are the same because they occur near an area where the route variations intersect (west/northwest of Morgan Lake).

Variation S2-E1

Six previously recorded sites have been identified along Variation S2-E1, including 1 pre-contact site, 3 historic sites, and 2 multi-component sites (Table 3-441). Of these sites, 2 are eligible for inclusion in the NRHP, 3 are not eligible, and 1 has not been evaluated. No previously recorded sites have been identified in the direct effects APE.

Site types include historic mines, one pre-contact lithic and tool scatter, one pre-contact lithic procurement area/homestead, and one pre-contact lithic scatter/homestead. Unrecorded segments of the Oregon NHT (including intact traces) are located approximately 1.4 miles east of Variation S2-E1 in the vicinity of Union (refer to map MV-25 for inventory data). There, the trail follows a northwest-southeast trajectory, and traverses the Clover Creek Valley to North Powder in Union County. Variation S2-E1 parallels the Oregon NHT for its entirety. One previously recorded, contributing segment of the trail is located along the western end of the route variation, outside of the study corridor. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-E2

Seven previously recorded sites have been identified along Variation S2-E2, including 1 pre-contact site, 4 historic sites, and 2 multi-component sites (one additional site than Variation S2-E1) (Table 3-441). The site identified along Variation S2-E2, but not along Variation S2-E1, is one segment of the Oregon NHT (contributing segment). One previously recorded site has been identified in the direct effects APE.

Variation S2-E2 lies approximately 165 feet to the west of an extensive multi-component site (pre-contact lithic procurement area/homestead). In addition, this route variation is closer to unrecorded, intact segments of the Oregon NHT than Variation S2-E1. These trail segments are located in the indirect effects APE, just east of the I-84 corridor and an existing transmission line (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S2-F1

Thirty-two previously recorded sites have been identified along Variation S2-F1, including 19 pre-contact sites, 9 historic sites, 2 multi-component sites, and 2 sites of unknown temporal affiliation (Table 3-441). Of these sites, 3 are eligible for inclusion in the NRHP, 5 are not eligible, and 24 have not been evaluated. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, cairns, and rock alignments. Historic site types include artifact scatters, homesteads, one mine, and one station (Clover Creek Station of the Oregon NHT). Multi-component site types are one pre-contact lithic procurement area/homestead and one pre-contact lithic scatter/homestead. There are two cairn sites of unknown temporal affiliation. The most commonly represented site types are pre-contact lithic scatters and rock features (cairns and rock alignments [pre-contact and unknown temporal affiliation]).

Variation S2-F1 (Link 2-75) crosses one unrecorded segment (unknown condition) of the Oregon NHT at I-84, approximately 6.5 miles southwest of Union (refer to map MV-25 for inventory data).

Unrecorded, intact segments of the trail are located in the vicinity of Link 2-75. The following trail-associated sites have been identified along this route variation, in the indirect effects APE: D. Dodge 1885 Inscription, Possible Pioneer Graves, and Clover Creek Station.

There is the potential for direct effects on undocumented, trail-associated sites along this route variation. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, resources that potentially would be affected visually, along this route variation, include buildings, waterworks, and historic transportation corridors. The route variation lies approximately 2.8 miles east of North Powder (Link 2-95 [closest distance]).

Variation S2-F2

Forty-three previously recorded sites have been identified along Variation S2-F2, including 27 pre-contact sites, 10 historic sites, 4 multi-component sites, and 2 sites of unknown temporal affiliation (11 more sites than Variation S2-F1) (Table 3-441). Sites identified along Variation S2-F2, but not along Variation S2-F1, include 8 pre-contact sites (lithic scatters and lithic procurement area), 1 historic site (artifact scatter), and 2 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters). The differences in the number of sites primarily occur along Link 2-70 (Craig Mountain area). No previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT (unrecorded segments of unknown condition) and trail-associated sites, identified along this route variation, are the same as those identified along Variation S2-F1, since the two route variations follow similar alignments in proximity to the trail. There also is the potential for direct effects on undocumented, trail-associated sites along this route variation. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S2-F1. Resources are the same because they occur near an area where the route variations are in proximity to one another (primarily in the vicinity of Jimmy Creek). Variation S2-F2 lies slightly farther from resources associated with North Powder.

Glass Hill Alternative

Cultural Resources Site Data

Ninety-five previously recorded sites have been identified along the Glass Hill Alternative, including 41 pre-contact sites, 44 historic sites, 8 multi-component sites, and 2 sites of unknown temporal affiliation (eight fewer sites than the Applicant's Proposed Action Alternative) (Table 3-441). Sites identified along the Applicant's Proposed Action Alternative, but not along the Glass Hill Alternative, include 5 pre-contact sites (lithic scatters and lithic and tool scatter), 2 historic sites (spring development and pioneer grave), and 1 multi-component site (pre-contact lithic scatter/historic habitation). The differences in the number and type of sites occur along Links 2-40 and 2-42 (southeast of La Grande). Most of the sites

occur in the areas where the alignments are shared (west of Oregon Route 244 and east of Little Rock Creek). Eight previously recorded sites have been identified in the direct effects APE.

Of the 95 previously recorded sites identified along this alternative route, 12 are eligible for inclusion in the NRHP, 13 are not eligible, and 68 have not been evaluated. The remaining cultural resource represents a segment of the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites).

The Glass Hill Alternative crosses the Mount Emily Lumber Company Railroad (unevaluated site), one pre-contact lithic scatter, and one homestead. There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to the tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder and La Grande, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located southwest of La Grande). Compared to the Applicant's Proposed Action Alternative, the Glass Hill Alternative (Link 2-42) lies approximately 4.4 miles away from the nearest resources associated with La Grande, and approximately 5.7 miles to the southwest of de La Grande Commercial Historic District. The Applicant's Proposed Action Alternative is closer to historic resources associated with La Grande. The Glass Hill Alternative (Link 2-95) lies approximately 3 miles away from the nearest resources associated with North Powder.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow the same alignment near Hilgard Junction and southwest of La Grande. This alternative route crosses the same unrecorded segment (unknown condition) of the Oregon NHT as the Applicant's Proposed Action Alternative, and avoids unrecorded, intact segments of the trail southeast of La Grande (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variations S2-D1 and S2-D2

There are no previously recorded sites along Variation S2-D1 and Variation S2-D2.

Mill Creek Alternative

Cultural Resources Site Data

A total of 128 previously recorded sites have been identified along the Mill Creek Alternative, including 58 pre-contact sites, 56 historic sites, 12 multi-component sites, and 2 sites of unknown temporal affiliation (25 more sites than the Applicant's Proposed Action Alternative) (Table 3-441). Of these sites, 13 are eligible for inclusion in the NRHP, 16 are not eligible, and 96 have not been evaluated. One site

(Administrative Building, Eastern Oregon State College [La Grande]) is listed in the NRHP. The remaining two cultural resources represent multiple contributing segments of the Oregon NHT. Five previously recorded sites have been identified in the direct effects APE.

Of the 128 previously recorded sites identified along the Mill Creek Alternative, 98 sites occur in those areas where the Mill Creek Alternative and the Applicant's Proposed Action become closer to one another (Hilgard area) or intersect.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, cairns, rock alignments, one lithic procurement area, one campsite, and one habitation (pithouses). Historic site types include artifact scatters, campsites, habitation structures (farming/ranching-related sites), homesteads, isolated features (hearth, cairns, and rock alignments), sawmills, pioneer grave sites, mines, one open well, one spring development, one building, one cemetery (Hilgard), one work camp (Hilgard Civilian Conservation Corps Camp), one station (Clover Creek Station of the Oregon NHT), one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation), trail-associated markers, and multiple historic linear sites (road, trails, and railroad segments). Multi-component sites include pre-contact lithic and tool scatter/historic artifact scatters, pre-contact lithic scatters/historic habitations, pre-contact lithic scatter/homestead and grave, one pre-contact lithic procurement area/homestead, and one pre-contact campsite/homestead. The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and historic habitation structures (farming/ranching-related sites).

The Logging Railway Network, the Railroad Mill Spurline, the Mount Emily Lumber Company Railroad, and the Oregon NHT (including the Whiskey Creek Segment) are located along this alternative route. The Mill Creek Alternative crosses the Mount Emily Lumber Company Railroad (unevaluated site) and one extensive multi-component site (pre-contact lithic procurement area/homestead).

Limited archaeological surveys have been conducted along the Mill Creek Alternative. Additional surveys could reveal more sites. There is the potential for direct effects on undocumented, significant sites near Morgan Lake and through the Ladd Marsh Wildlife Area (Link 2-63). This alternative route avoids the Glass Hill area.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder and La Grande (La Grande Commercial Historic District), resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Mill Creek Alternative is considerably closer to the La Grande Commercial Historic District (Links 2-10 and 2-12). It lies approximately 1.4 miles to the southwest of the historic district's southwestern boundary. Compared to the Applicant's Proposed Action Alternative, the Mill Creek Alternative (Link 2-80) lies farther from resources associated with North Powder.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments near Hilgard Junction and southwest of La Grande. However, one unrecorded segment of

the Oregon NHT has been identified in the direct effects APE, just northeast of Morgan Lake in La Grande area (refer to map MV-25 for inventory data). Of the alternative routes considered under Segment 2, the Mill Creek Alternative is the closest to the Oregon NHT.

Seventeen trail-associated sites have been identified along the Mill Creek Alternative, in the indirect effects APE; these include Pioneer Spring, Hilgard Junction, Emily Doone Grave (1868), Stone Marker, two Oregon NHT monuments, Stage Stations, Three Pioneer Graves, Copper Kettle Grave), Possible Pioneer Grave, Trading Post Site, Pioneer Campsite, the D. Dodge 1885 Inscription, and the Clover Creek Station. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 3—BAKER VALLEY

There are 297 previously recorded sites along Segment 3; these include 112 pre-contact sites, 163 historic sites, 14 multi-component sites (pre-contact and historic components), and 8 sites of unknown temporal affiliation. Of these sites, 47 are eligible for inclusion in the NRHP, 29 are not eligible, and 212 have not been evaluated. The remaining nine resources represent multiple contributing segments of two significant linear sites (Oregon NHT and Goodale's Cutoff Study Trail). These results are summarized in Table 3-442, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 3; these include pre-contact and historic cairns and rock alignments, the Goodale's Cutoff Study Trail, the Oregon NHT, trail-associated sites (including the Slough House Stage Station [Stop]), and Native American concerns (e.g., Burnt River Canyon and Durkee areas). A number of historic trails/wagon roads, waterworks, and mining-related sites also are present along Segment 3. Several pre-contact rockshelters have been documented in the Baker Valley.

Based on RLS cultural data, resources identified within 5 miles of Segment 3 that potentially would be affected visually include numerous historic buildings, waterworks, mining operations, and historic transportation corridors (trails, roads, and railroad segments) associated with North Powder, Weatherby, Sparta, Baker City Historic District, and the Virtue Flat Mining Area. In addition, Signature Rock, one unidentified Goal Resource 5, and the Medical Hot Springs are located in the vicinity of the study corridor.

Applicant's Proposed Action Alternative

Cultural Resources Site Data

Seventy-two previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 18 pre-contact sites and 54 historic sites (Table 3-442). Of these sites, 5 are eligible for inclusion in the NRHP, 11 are not eligible, and 48 have not been evaluated. The remaining eight cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. Ten previously recorded sites have been identified in the direct effects APE.

Table 3-442. Summary of Cultural Resources Inventory Data for Segment 3—Baker Valley

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]															National Historic Trails /Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites				Not Eligible Sites				Unevaluated Sites				Contributing Segments of the Oregon NHT and the Goodale's Cutoff Study Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	2	3	0	0	2	9	0	0	14	34	0	0	8	0	72	2	10
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*2*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*0*
Variation S3-B1	*0*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*20*	*0*	*0*	*3*	*0*	*34*	*2*	*2*
Variation S3-B2	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*12*	*0*	*1*	*3*	*0*	*27*	*2*	*1*
Variation S3-B3	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*13*	*0*	*1*	*3*	*0*	*28*	*2*	*1*
Variation S3-B4	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*10*	*0*	*1*	*3*	*0*	*25*	*2*	*1*
Variation S3-B5	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*8*	*0*	*1*	*3*	*0*	*23*	*2*	*1*
Variation S3-C1	*2*	*1*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*13*	*0*	*0*	*5*	*0*	*30*	*1*	*6*
Variation S3-C2	*2*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*12*	*12*	*0*	*0*	*5*	*0*	*37*	*1*	*5*
Variation S3-C3	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*2*
Variation S3-C4	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*3*
Variation S3-C5	*2*	*2*	*0*	*0*	*1*	*1*	*0*	*0*	*15*	*7*	*1*	*0*	*2*	*0*	*31*	*1*	*2*
Variation S3-C6	*2*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*14*	*6*	*1*	*0*	*2*	*0*	*27*	*1*	*1*
Flagstaff A	2	3	0	0	2	8	0	0	15	22	0	1	8	0	61	2	9
Timber Canyon	27	11	3	1	6	15	0	1	49	92	10	5	5	0	225	2	15

Table 3-442. Summary of Cultural Resources Inventory Data for Segment 3—Baker Valley

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]															National Historic Trails /Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites				Not Eligible Sites				Unevaluated Sites				Contributing Segments of the Oregon NHT and the Goodale's Cutoff Study Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Flagstaff A – Burnt River Mountain	2	4	0	0	2	7	0	0	25	17	0	1	6	0	64	2	6
Flagstaff B	2	3	0	0	2	8	0	0	15	27	0	1	8	0	66	2	9
Flagstaff B – Burnt River West	2	4	0	0	2	6	0	0	25	21	1	1	5	0	67	2	4
Flagstaff B – Durkee	2	3	0	0	2	5	0	0	24	20	1	1	5	0	63	2	4

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear sites. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

NRHP = National Register of Historic Places

Pre-contact site types include lithic and artifact scatters, cairns and rock alignments, lithic procurement areas, and one hunting blind. Historic site types include artifact scatters, kilns, mines and prospects, inscriptions, habitation structures (farming/ranching-related sites), homesteads, water troughs, structures of unknown function, one cemetery (Lime-Dixie), one root cellar (Dixie Cellar), one livestock watering point, one foundation, one well, and multiple historic linear sites (utility line, trail, and road segments). The most commonly represented site types are pre-contact lithic scatters, historic artifact scatters, and mining-related sites.

The Burnt River to Boise City Road, the Goodale's Cutoff Study Trail, the Oregon NHT, and trail-associated sites/components (monuments and landmarks) are located along this alternative route. Of these sites, the Oregon NHT (contributing segment) and the Goodale's Cutoff Study Trail (contributing segment) are in the direct effects APE. There is the potential for direct effects on undocumented, rock features (primarily cairns) in the Durkee area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually, along this alternative route, include numerous historic buildings and structures, waterworks, mining operations, and historic transportation corridors. The Virtue Flat Mining Area is crossed at Link 3-28. Of the alternative routes considered under Segment 3, the Applicant's Proposed Action Alternative is the closest route to the communities of Durkee and Weatherby. Signature Rock has been documented approximately 3 miles east of Link 3-28. This alternative route avoids the Baker City Historic District (5.1 miles away from Link 3-28).

National Historic Trails/Potential National Historic Trails

The Virtue Flat Segment of the Oregon NHT is located in the direct effects APE, and is crosses by the Applicant's Proposed Action Alternative (Link 3-28) to the northeast of Baker City. This previously recorded segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. A previously recorded segment of the trail (Flagstaff Hill) is in the indirect effects APE, just east of Link 3-28.

The Oregon NHT (unrecorded segments) parallels the Applicant's Proposed Action Alternative (Links 3-58 and Link 3-78) and follows the I-84 corridor before crossing the route (Link 3-80) near Durkee (refer to map MV-25 for inventory data). The portion of the trail (previously recorded spur) that crosses Link 3-80 was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Southeast of Durkee, the route closely parallels the Oregon NHT, and crosses the trail (previously recorded and unrecorded segments) multiple times near Weatherby (Link 3-88). One segment of the Oregon NHT (Goal 5 Segment) lies approximately 0.6 mile east of Links 3-88 and 3-92, southeast of Dixie. This previously recorded segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT.

The following trail-associated sites are located along the Applicant's Proposed Action Alternative, in the indirect effects APE: Gentry Crossing, Possible Site of the "Lone Tree," Oregon Trail Monument, and

Flagstaff Hill. One significant trail-associated site in the study corridor (near Link 3-26) is the historic Slough House Stage Station (Stop). The stage station lies near the Oregon NHT at the intersection of the Road to Auburn (along the same alignment as I-84) and the Baldock Slough.

Link 3-28 crosses one east-northeast trending, previously recorded segment of the Goodale's Cutoff Study Trail (contributing segment) running alongside Ruckles Creek, just northeast of Baker City. Previously recorded, contributing segments of the trail have been identified in the indirect effects APE, to the east of Link 3-28. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S3-A1

Eight previously recorded sites have been identified along Variation S3-A1, including four pre-contact sites and four historic sites (Table 3-442). Of these sites, three are not eligible for the NRHP and five have not been evaluated. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and cairns. Historic site types include artifact scatters and mines. Unrecorded segments of the Oregon NHT have been identified in the indirect effects APE, approximately 2.0 miles to the west of the route variation (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, resources that potentially would be affected visually, along this route variation, include numerous historic buildings, structures, and waterworks.

Variation S3-A2

Although Variation S3-A2 and Variation S3-A1 do not share the same alignment, they are in proximity to one another, and the same previously recorded sites are identified for both route variations (Table 3-442). No previously recorded sites have been identified in the direct effects APE.

Unrecorded segments of the Oregon NHT identified along Variation S3-A2 are the same as those identified along Variation S3-A1, since the two route variations follow similar alignments in proximity to the trail (refer to map MV-25 for inventory data). The historic trail is located in the vicinity of the study corridor (2.1 miles to the west of the route variation).

Although Variation S3-A2 and Variation S3-A1 do not share the same alignment, they are in proximity to one another, and the same resources that potentially would be affected visually along Variation S3-A1 are the same as those identified along Variation S3-A2.

Variation S3-B1

Thirty-four previously recorded sites have been identified along Variation S3-B1, including 6 pre-contact sites and 28 historic sites (Table 3-442). Of these sites, 2 are eligible for inclusion in the NRHP, 4 are not eligible, and 25 have not been evaluated. The remaining three cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. Two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and rock alignments. Historic site types include artifact scatters, mines and prospects, one livestock watering point, trail-associated sites/components (monuments and landmarks), and historic linear sites (Oregon NHT and Goodale's Cutoff Study Trail). The most commonly represented site types are pre-contact lithic scatters, mining-related sites, and historic artifact scatters.

Link 3-28 crosses the Virtue Flat Segment of the Oregon NHT to the northeast of Baker City. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. One contributing segment of the Oregon NHT (Flagstaff Hill) is in the indirect effect APE. The following trail-associated sites are located along Variation S3-B1, in the indirect effects APE: Possible Site of the "Lone Tree," Oregon Trail Monument, Flagstaff Hill, and the historic Slough House Stage Station (Stop).

Link 3-28 crosses one previously recorded segment of the Goodale's Cutoff Study Trail (contributing segment) running alongside Ruckles Creek, just northeast of Baker City. Previously recorded, contributing segments of the trail have been identified in the indirect effects APE to the east of Link 3-28. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity the Virtue Flat Mining Area, resources that potentially would be affected visually, along this route variation, include numerous historic mining operations. In addition, Signature Rock has been documented approximately 3 miles east of the route variation. Variation S3-B1 avoids the Baker City Commercial Historic District (5.1 miles away from Link 3-28).

Variation S3-B2

Twenty-seven previously recorded sites have been identified along Variation S3-B2, including 7 pre-contact sites, 19 historic sites, and 1 site of unknown temporal affiliation (seven fewer sites than Variation S3-B1) (Table 3-442). Sites identified along Variation S3-B1, but not along Variation S3-B2, include two pre-contact sites (lithic scatters) and nine historic sites (artifact scatter and mines). Four sites identified along Variation S3-B2 are not located within the study corridor for Variation S3-B1. These sites include three pre-contact sites (lithic scatter, lithic and tool scatter, and rock alignment) and one rock alignment of unknown temporal affiliation. The differences in the number of sites occur primarily along the northern half of the route variation. Sites shared by the route variations occur in the areas where the alignments become closer to one another or intersect. The most commonly represented site types are mining-related sites and historic artifact scatters. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B2, are the same as those identified along Variation S3-B1. Although these route variations cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. Link 3-37 crosses one unrecorded segment of the Goodale's Cutoff Study Trail running alongside Ruckles Creek, west of Flagstaff Hill (refer to map MV-26 for inventory data). Previously recorded, contributing segments of the

Goodale's Cutoff Study Trail have been identified in the indirect effects APE, to the east of Link 3-37. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of the community of Baker and the Virtue Flat Mining Area, resources that potentially would be affected visually, along this route variation, include numerous historic buildings, structures, waterworks, mining operations, and transportation corridors. This route variation does not cross the historic mining area and lies farther from Signature Rock. One unidentified Goal 5 Resource is located approximately 4.2 miles northwest of this route variation. In addition, this route variation is closer to resources associated with the Baker City Historic District than Variation S3-B1. There, over one hundred historic properties, primarily residential and commercial buildings, have been listed in the NRHP.

Note: Because the affected environment for Variations S3-B3, S3-B4, and S3-B5 would be similar to Variation S3-B2, these four route variations are compared.

Variation S3-B3

Twenty-eight previously recorded sites have been identified along Variation S3-B3, including 7 pre-contact sites, 20 historic sites, and 1 site of unknown temporal affiliation (one additional site than Variation S3-B2) (Table 3-442).

The site identified along Variation S3-B3, but not along Variation S3-B2, is a historic artifact scatter. The differences in the number of sites occur along Link 3-44, where the alignments differ. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B3, are the same as those identified along Variation S3-B2, since the two route variations follow the same alignment in proximity to the trail. Segments of the Goodale's Cutoff Study Trail, identified along Variation S3-B3, are the same as those identified along Variation S3-B2, since the two route variations follow the same alignment in proximity to the trail (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of the community of Baker and the Virtue Flat Mining Area, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-B2. These route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B4

Twenty-five previously recorded sites have been identified along Variation S3-B4, including 7 pre-contact sites, 17 historic sites, and 1 site of unknown temporal affiliation (2 fewer sites than Variation S3-B2) (Table 3-442).

Sites identified along Variation S3-B2, but not along Variation S3-B4, include three historic sites (mining-related sites and artifact scatter). One historic site (artifact scatter) identified along Variation S3-B4 is not located within the study corridor for Variation S3-B2. The differences in the number of sites

occur primarily along the northern half of the route variation. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B4, are the same as those identified along Variation S3-B2, since the two route variations follow similar alignments in proximity to the trail. Variation S3-B4 crosses the Virtue Flat Segment of the Oregon NHT and one unrecorded segment of the Goodale's Cutoff Study Trail, approximately 0.1 mile west of Variation S3-B2 (refer to map MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Baker City Historic District and the Virtue Flat Mining Area, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-B2. These two route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B5

Twenty-three previously recorded sites have been identified along Variation S3-B5, including 7 pre-contact sites, 15 historic sites, and 1 site of unknown temporal affiliation (four fewer sites than Variation S3-B2) (Table 3-442).

Sites identified along Variation S3-B2, but not along Variation S3-B5, include four historic sites (mining-related sites and historic scatter). The differences in the number of sites occur primarily along the northern half of the route variations. Only one previously recorded site has been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-B5, are the same as those identified along Variation S3-B2, since the two route variations follow similar alignments in proximity to the trail. Variation S3-B5 crosses the Virtue Flat Segment of the Oregon NHT and one unrecorded segment of the Goodale's Cutoff Study Trail, approximately 0.2 mile west of Variation S3-B2 (refer to map MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Baker City Historic District and the Virtue Flat Mining Area, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-B2. These route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-C1

Thirty previously recorded sites have been identified along Variation S3-C1, including 8 pre-contact sites and 22 historic sites (Table 3-442). Of these sites, 3 are eligible for inclusion in the NRHP, 4 are not eligible, and 18 have not been evaluated. The remaining five cultural resources represent multiple

contributing segments of the Oregon NHT. Six previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, one cairn, and one hunting blind. Historic site types include homesteads, buildings, foundation and structural remains, inscriptions, one well, one water trough, one root cellar (Dixie Cellar), one cemetery (Lime-Dixie), one kiln, one trail landmark (Rattlesnake Springs Landmark of the Oregon NHT), and multiple historic linear sites (utility line, road, and trail segments). The Burnt River to Boise City Road and multiple segments of the Oregon NHT are located along this route variation. Of these sites, only the Oregon NHT is in the direct effects APE. The most commonly represented site types are historic linear sites (canal, utility line, road, and trail segments).

The Oregon NHT (unrecorded segments) parallels Variation S3-C1 (Links 3-58 and 3-78) and follows the I-84 corridor before crossing the route variation (Link 3-80) near Durkee (refer to map MV-25 for inventory data). The portion of the trail (spur) that crosses Link 3-80 was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Southeast of Durkee, the route variation closely parallels the Oregon NHT, and crosses the trail (previously recorded and unrecorded segments) multiple times near Weatherby (Link 3-88). The Oregon NHT (Goal 5 Segment) parallels Links 3-88 and 3-92 southeast of Dixie. This previously recorded segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually, along this route variation, include numerous historic buildings, structures, waterworks, and historic transportation corridors.

Variation S3-C2

Thirty-seven previously recorded sites have been identified along Variation S3-C2, including 15 pre-contact sites and 22 historic sites (seven more sites than Variation S3-C1) (Table 3-442). Sites identified along Variation S3-C2, but not along Variation S3-C1, include seven pre-contact sites (lithic scatters, lithic procurement area, and rock alignment) and one historic site (Schuck Irrigation Ditch). One historic site (homestead) identified along Variation S3-C1 is not located within the study corridor for Variation S3-C2. The differences in the number of sites occur along Links 3-42, the only area in which the alignments differ. The most commonly represented site types are pre-contact lithic scatters and historic linear sites. Five previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT and trail-associated sites, identified along Variation S3-C2, are the same as those identified along Variation S3-C1, except for the northern portion of Variation S3-C2 (Link 3-42), which veers west and runs closer to the trail (northwest of Durkee). There, the trail roughly follows the I-84 corridor. Both Variation S3-C2 and Variation S3-C1 cross one previously recorded, contributing segment of the Oregon NHT (spur [Link 3-80]). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-C1. These route variations follow the same alignment, passing in proximity to the same resources.

Variation S3-C3

Thirty-three previously recorded sites have been identified along Variation S3-C3, including 18 pre-contact sites and 15 historic sites (three more sites than Variation S3-C1) (Table 3-442). Sites identified along Variation S3-C3, but not along Variation S3-C1, include ten pre-contact sites (lithic scatters, lithic procurement areas, lithic and tool scatter, and rock alignment) and one historic site (Schuck Irrigation Ditch). Eight sites identified along Variation S3-C1 are not located within the study corridor for Variation S3-C3. These sites include 2 homesteads, 1 rock panel with inscriptions, 1 building, 1 utility line, 1 historic structure of unknown function, and 2 segments of the Oregon NHT. The differences in the number of sites occur along Link 3-64, where the alignments differ. Sites shared by the route variations occur in the areas where the alignments become closer to one another or intersect (vicinity of Straw Ranch Creek and northwest of Weatherby). The most commonly represented site types are pre-contact lithic scatters, pre-contact procurement areas, and historic transportation corridors (Burnt River to Boise City Road and several segments of the Oregon NHT). Two previously recorded sites have been identified in the direct effects APE.

Variation S3-C3 crosses the Schuck Irrigation Ditch (unevaluated) and the Oregon NHT. The northern portion of Variation S3-C3 crosses one unrecorded segment (unknown condition) of the Oregon NHT at Link 3-60 and avoids the trail crossing near Durkee (refer to map MV-25 for inventory data). East and south/southeast of Weatherby, segments of the Oregon NHT crossed and/or paralleled by the route variation are the same as those identified along Variation S3-C1. There, the two route variations share the same alignment. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on unrecorded, significant sites along this route variation (primarily in the Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are similar to those identified along Variation S3-C1. Variation S3-C3 lies farther from historic resources associated with Durkee.

Note: Because the affected environment for Variations S3-C4, S3-C5, and S3-C6 would be similar to Variation S3-C3, these four route variations are compared.

Variation S3-C4

Previously recorded sites identified along Variation S3-C4 are the same as those identified along Variation S3-C3, since these two route variations are identical over the majority of their length (Table 3-442). These route variations share the same alignment, except for a portion (Links 3-68 and 3-

70) crossing Burnt River Canyon. Three previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT, identified along this route variation, are the same as those identified along Variation S3-C3, since the two route variations shared the same alignment in proximity to the trail. Both Variation S3-C4 and Variation S3-C4 share an alignment where the Schuck Irrigation Ditch (unevaluated) and the Oregon NHT are crossed. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on undocumented, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S3-C3. These route variations share the same alignment, passing in proximity to the same resources.

Variation S3-C5

Thirty-one previously recorded sites have been identified along Variation S3-C5, including 18 pre-contact sites, 12 historic sites, and 1 multi-component site (two fewer sites than Variation S3-C3) (Table 3-442).

Sites identified along Variation S3-C3, but not along Variation S3-C5, include three historic sites (artifact scatter, structure of unknown function, and one segment of the Oregon NHT). One multi-component site (pre-contact lithic scatter/mining claim) identified along Variation S3-C5 is not located within the study corridor for Variation S3-C3. The differences in the number of sites primarily occur along Link 3-73, where the alignments differ significantly. Two previously recorded sites have been identified in the direct effects APE.

Both Variation S3-C5 and Variation S3-C3 share an alignment where the Schuck Irrigation Ditch (unevaluated) is crossed. Like Variation S3-C3, the northern end of Variation S3-C5 crosses one unrecorded segment of the Oregon NHT at Link 3-60, and then deviates from the Oregon NHT for the majority of its length (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are similar to those identified along Variation S3-C3. Variation S3-C5 lies farther from historic resources associated with Durkee and Weatherby.

Variation S3-C6

Twenty-seven previously recorded sites have been identified along Variation S3-C6, including 17 pre-contact sites, 9 historic sites, and 1 multi-component site (six fewer sites than Variation S3-C3) (Table 3-442). Only one previously recorded site has been identified in the direct effects APE.

Of the 27 previously recorded sites identified along Variation S3-C6, 10 sites occur in the areas where Variation S3-C6 and Variation S3-C3 share the same alignment (northern end) or become closer to one another. Both route variations cross the Oregon NHT and the Schuck Irrigation Ditch (unevaluated).

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, lithic procurement areas, and rock features (cairn and rock alignment). Historic site types include water troughs, one artifact scatter, one cemetery (Lime-Dixie), one kiln (Langely), one cellar (Dixie Cellar), and several linear sites (Schuck Irrigation Ditch and the Oregon NHT). One multi-component site (pre-contact lithic scatter/mine) was identified along this route variation. The most commonly represented site types are pre-contact lithic scatters.

Like Variation S3-C3, Variation S3-C6 crosses one unrecorded segment of the Oregon NHT at Link 3-60 and then deviates significantly from the Oregon NHT for the majority of its length (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Limited archaeological surveys have been conducted along this route variation. Additional surveys could reveal more sites. There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Durkee and Weatherby, resources that potentially would be affected visually along this route variation are similar to those identified along Variation S3-C3. Variation S3-C6 lies farther from historic resources associated with Durkee and Weatherby.

Flagstaff A Alternative

Cultural Resources Site Data

Sixty-one previously recorded sites have been identified along the Flagstaff A Alternative, including 19 pre-contact sites, 41 historic sites, and 1 site of unknown temporal affiliation (11 fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff A Alternative, include 2 pre-contact sites (lithic scatters) and 13 historic sites (artifact scatters, mines, and prospects). Four sites (pre-contact lithic scatter, pre-contact lithic and tool scatter, pre-contact structural/cairn, and rock alignment) identified along the Flagstaff A Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. The differences in the number and type of sites occur east of the Baker Valley. Most of the previously recorded sites occur in the areas where the alignments are shared (North Powder Valley and

east/southeast of Lone Pine Mountain), or are in proximity to one another. Nine previously recorded sites have been identified in the direct effects APE.

Of the 61 previously recorded sites identified along this alternative route, 5 are eligible for inclusion in the NRHP, 10 are not eligible, and 38 have not been evaluated. The remaining eight cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns and rock alignments), mining-related sites, and historic transportation corridors (road and trail segments).

This alternative route crosses the Oregon NHT (contributing segment) and one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff A Alternative is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of the alternative route) and lies farther from the Virtue Flat Mining Area (approximately 2.4 miles to the east of the alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff A Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. East/southeast of Lone Pine Mountain, both the Flagstaff A Alternative and the Applicant's Proposed Action Alternative, cross the historic trail (previously recorded and unrecorded segments) multiple times (refer to map MV-25 for inventory data).

Link 3-34 crosses an east-northeast trending, unrecorded segment of the Goodale's Cutoff Study Trail running alongside Ruckles Creek, just northeast Baker City (refer to map MV-26 for inventory data). Previously recorded, contributing segments of the trail have been identified in the indirect effects APE, to the east of Link 3-34. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Timber Canyon Alternative

Cultural Resources Site Data

A total of 225 previously recorded sites have been identified along the Timber Canyon Alternative, including 82 pre-contact sites, 123 historic sites, 13 multi-component sites, and 7 sites of unknown temporal affiliation (153 more sites than the Applicant's Proposed Action Alternative) (Table 3-442). Of these sites, 42 are eligible for inclusion in the NRHP, 22 are not eligible, and 156 have not been

evaluated. The remaining five cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. Fifteen previously recorded sites have been identified in the direct effects APE.

Of the 225 previously recorded sites identified along the Timber Canyon Alternative, 20 sites occur in those areas where the alternative routes originate (Riverdale Hill, east of North Powder), and where they share the same alignment (southeast of Durkee). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, rock features (rock alignments and cairns), rockshelters, one hunting blind, one structural site/rock alignment of unknown function, and one potential "Medicine Wheel." Historic site types include artifact scatters, buildings, habitation structures (farming/ranching-related sites), homesteads, livestock enclosures, waterworks, isolated features and structures (e.g., cairn, foundation), dendroglyphs, inscriptions, mining-related sites (e.g., mines, camps, prospects), campsites, sawmills, water troughs, one bridge, one kiln, one root cellar (Dixie Cellar), one well, one cemetery (Lime-Dixie), and multiple historic linear sites (ditch, utility line, road, and trail segments). Multi-component sites include pre-contact lithic scatters/historic artifact scatters, pre-contact lithic and tool scatters/farming-related structures, pre-contact lithic and tool scatters/historic artifact scatters, pre-contact lithic scatters/historic habitation, pre-contact lithic scatters/sawmill, and pre-contact lithic scatters/prospects and mines. Several cairns of undetermined temporal affiliation also were identified along this alternative route. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact cairns and rock alignments (primarily cairns), historic habitation structures and homesteads, mines, and irrigation features (ditches and canals).

The Sparta Ditch Lateral, the Waterbury Ditch, the Dry Gulch Ditch, the Goodale's Cutoff Study Trail, and the Oregon NHT are located along this alternative route in the direct effects APE; these sites are crossed by the alternative route. A culturally sensitive area of Native American concern (Medical Hot Springs) is located in the indirect effects APE (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Sparta, Weatherby, and North Powder, resources that potentially would be affected visually, along this alternative route, include numerous historic buildings, waterworks, and historic transportation corridors.

National Historic Trails/Potential National Historic Trails

East of the community of North Powder, the Timber Canyon Alternative diverts west and avoids the Oregon NHT for the majority of its length. Primarily, this alternative route avoids the Virtue Flat Segment of the Oregon NHT near Baker City, by many miles. The alternative route rejoins the trail corridor southeast of Durkee. Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments (Baker Valley). Southeast of Durkee, segments of the Oregon NHT, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative.

Two previously recorded segments of the Goodale's Cutoff Study Trail (main trail alignment and a 0.8-mile-long spur) are located in the direct effects APE, and are crossed by the alternative route (Link 3-8) to the northwest of the Eagle Valley in Baker County. These segments of the trail were evaluated as contributing to the overall NRHP eligibility of the Goodale's Cutoff Study Trail. Additional segments of the trail also have been identified in the indirect effects APE, to the east and west of Link 3-8 (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff A – Burnt River Mountain Alternative

Cultural Resources Site Data

Sixty-four previously recorded sites have been identified along the Flagstaff A – Burnt River Mountain Alternative, including 29 pre-contact sites, 34 historic sites, and 1 site of unknown temporal affiliation (eight fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff A – Burnt River Mountain Alternative, include 2 pre-contact sites (lithic scatters) and 21 historic sites (artifact scatters, mining-related sites, homesteads, inscriptions, building, structure of unknown function, utility line, and segments of the Oregon NHT). Fifteen sites identified along the Flagstaff A – Burnt River Mountain Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include the Schuck Irrigation Ditch, pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact lithic procurement areas, pre-contact rock alignments, one pre-contact structural/cairn, and one rock alignment of unknown temporal affiliation. The differences in the number and type of sites occur east of the Baker Valley and southeast of Pleasant Valley. Six previously recorded sites have been identified in the direct effects APE.

Of the 64 previously recorded sites identified along this alternative route, 6 are eligible for inclusion in the NRHP, 9 are not eligible, and 43 have not been evaluated. The remaining six cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns and rock alignments), mining-related sites, and historic transportation corridors (road and trail segments).

One pre-contact cairn site, the Oregon NHT (contributing segment), and the Shuck Irrigation Ditch are in the direct effects APE. Of these sites, the historic linear sites are crossed by this alternative route. The Flagstaff A – Burnt River Mountain Alternative also crosses one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action

Alternative. The Flagstaff A – Burnt River Mountain Alternative lies farther from historic resources associated with Durkee and the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of the alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff A – Burnt River Mountain Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. Southeast of Pleasant Valley, the alternative route crosses one unrecorded segment of the Oregon NHT and avoids trail crossings near Durkee (Durkee Valley) and Weatherby (refer to map MV-25 for inventory data).

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative, since the two alternative routes share an alignment in proximity to the trail (refer to map MV-26 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff B Alternative

Cultural Resources Site Data

Sixty-four previously recorded sites have been identified along the Flagstaff B Alternative, including 29 pre-contact sites, 34 historic sites, and 1 site of unknown temporal affiliation (six fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff B Alternative, include two pre-contact sites (lithic scatters) and nine historic sites (artifact scatters and mines). Five sites identified along the Flagstaff B Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include one pre-contact lithic scatter, one pre-contact lithic and tool scatter, one pre-contact structural/cairn, one historic artifact scatter, and one rock alignment of unknown temporal affiliation. The differences in the number and type of sites occur along the southeastern end of the Baker Valley. Most of the previously recorded sites occur in the areas where the alignments are shared (North Powder Valley and east/southeast of Lone Pine), or are in proximity to one another. Nine previously recorded sites have been identified in the direct effects APE.

Of the 64 previously recorded sites identified along this alternative route, 5 are eligible for inclusion in the NRHP, 10 are not eligible, and 43 have not been evaluated. The remaining eight cultural resources represent multiple contributing segments of the Oregon NHT and the Goodale's Cutoff Study Trail. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns/rock alignments), mining-related sites, and historic transportation corridors (road and trail segments). The Flagstaff B Alternative crosses the Oregon NHT (contributing segments) and one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

Limited archaeological surveys have been conducted along the Flagstaff B Alternative. Additional surveys could reveal more sites.

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff B Alternative lies farther from the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of the alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff B Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. East/southeast of Lone Pine Mountain, both the Flagstaff B Alternative and the Applicant's Proposed Action Alternative, cross the historic trail (previously recorded and unrecorded segments) multiple times (refer to map MV-25 for inventory data).

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative (refer to map MV-26 for inventory data). Although the alternative routes cross the same segment of the trail, the exact location they cross (Link 3-37) varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff B – Burnt River West Alternative

Cultural Resources Site Data

Sixty-seven previously recorded sites have been identified along the Flagstaff B – Burnt River West Alternative, including 29 pre-contact sites, 36 historic sites, 1 multi-component site, and 1 site of unknown temporal affiliation (five fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff B – Burnt River West Alternative, include 2 pre-contact sites (lithic scatters) and 20 historic sites (artifact scatters, mines, homesteads, inscriptions, building, structure of unknown function, utility line, and segments of the Oregon NHT). Seventeen sites identified along the Flagstaff B – Burnt River West Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include several pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact lithic procurement areas, one pre-contact structural/cairn, one pre-contact rock alignment, one historic artifact scatter, one rock alignment of unknown temporal affiliation, and the Schuck Irrigation Ditch. The differences in the number and type of sites occur east of the Baker Valley and southeast of Pleasant Valley. Four previously recorded sites have been identified in the direct effects APE.

Of the 67 previously recorded sites identified along this alternative route, 6 are eligible for inclusion in the NRHP, 8 are not eligible, and 48 have not been evaluated. The remaining five cultural resources represent multiple contributing segments of the Goodale's Cutoff Study Trail and the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns/rock alignments), mining-related sites, and historic transportation corridors (road and trail segments).

One pre-contact cairn site, the Oregon NHT (contributing segment), and the Shuck Irrigation Ditch are in the direct effects APE. Of these sites, the historic linear sites are crossed by this alternative route. The Flagstaff B – Burnt River West Alternative also crosses one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff B – Burnt River West Alternative lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of this alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff B – Burnt River West Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT (Virtue Flat Segment), the exact location they cross varies. Southeast of Pleasant Valley, the alternative route crosses one unrecorded segment of the Oregon NHT and then deviates significantly from the Oregon NHT for the majority of its length.

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative (refer to map MV-26 for inventory data). Although the alternative routes cross the same segment of the trail, the exact location (Link 3-37) they cross varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Flagstaff B – Durkee Alternative

Cultural Resources Site Data

Sixty-three previously recorded sites have been identified along the Flagstaff B – Durkee Alternative, including 28 pre-contact sites, 33 historic sites, 1 multi-component site, and 1 site of unknown temporal

affiliation (nine fewer sites than the Applicant's Proposed Action Alternative) (Table 3-442). Sites identified along the Applicant's Proposed Action Alternative, but not along the Flagstaff B – Durkee Alternative, include 3 pre-contact sites (lithic scatters and lithic and tool scatter) and 24 historic sites (mines, artifact scatter, homesteads, building, foundation, inscriptions, unknown structure, open well, the Burnt River to Boise City Road, Oregon NHT-associated landmark [Rattlesnake Spring], and multiple segments of the Oregon NHT). Eighteen sites identified along the Flagstaff B – Durkee Alternative are not located within the study corridor for the Applicant's Proposed Action Alternative. These sites include pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact lithic procurement area, pre-contact rock alignment, pre-contact structural site/cairns of unknown function, historic artifact scatters, pre -contact lithic scatter/mining claim, one rock alignment of unknown temporal affiliation, and the Schuck Irrigation Ditch. The differences in the number and type of sites occur east of the Baker Valley and southeast of Pleasant Valley. Four previously recorded sites have been identified in the direct effects APE.

Of the 63 previously recorded sites identified along this alternative route, 5 are eligible for inclusion in the NRHP, 7 are not eligible, and 46 have not been evaluated. The remaining five cultural resources represent multiple contributing segments of the Goodale's Cutoff Study Trail and the Oregon NHT. The most commonly represented site types are pre-contact lithic scatters, pre-contact rock features (cairns and rock alignments), historic artifact scatters, mining-related sites, and historic transportation corridors (roads and trails).

The Schuck Irrigation Ditch and the Oregon NHT are in the direct effects APE; these resources are crossed by the Flagstaff B – Durkee Alternative. This alternative route also crosses one unrecorded segment of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data).

There is the potential for direct effects on undocumented, significant sites along the southern portion of the alternative route (south of Alder Creek and west of the Durkee Valley). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of North Powder, Baker City, Durkee, Weatherby, and the Virtue Flat Mining Area, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Flagstaff B – Durkee Alternative lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. In addition, this alternative route is located in the vicinity of one undetermined Goal 5 Resource (approximately 3.5 miles west of this alternative route). Compared to the Applicant's Proposed Action Alternative, the Flagstaff B – Durkee Alternative is closer to resources associated with the Baker City Historic District.

National Historic Trails/Potential National Historic Trails

Segments of the Oregon NHT and trail-associated sites, identified along the northern half of this alternative route, are the same as those identified along the northern half of the Applicant's Proposed Action Alternative, since the two alternative routes are close to one another in proximity to the trail (east of the Baker Valley). Although the alternative routes cross the same segment of the Oregon NHT

(Virtue Flat Segment), the exact location they cross varies. Southeast of Pleasant Valley, the alternative route crosses one unrecorded segment of the Oregon NHT and then deviates significantly from the Oregon NHT for the majority of its length.

The unrecorded segment of the Goodale's Cutoff Study Trail, crossed by this alternative route, is the same as the segment crossed by the Flagstaff A Alternative (refer to map MV-26 for inventory data). Although the alternative routes cross the same segment of the trail, the exact location they cross (Link 3-37) varies. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 4—BROGAN

There are 175 previously recorded sites along Segment 4; these include 118 pre-contact sites, 39 historic sites, 13 multi-component sites (pre-contact and historic components), and 5 sites of unknown temporal affiliation. Of these sites, 23 are eligible for inclusion in the NRHP, 15 are not eligible, and 132 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. The remaining four resources represent multiple contributing segments of the Oregon NHT. These results are summarized in Table 3-443, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 4; these include the Oregon NHT, trail-associated sites, the Dalles-Boise Military Road, the Olds Ferry Road Study Trail, the Olds Ferry Railroad Station, the Vale Oregon Main Canal, the Huntington Cemetery, the Lime-Dixie Cemetery, and the Dell Cemetery. A number of pre-contact human burial sites, historic transportation corridors, and waterworks also are present along Segment 4. Areas of Native American concern include the Striped Mountain and Farewell Bend (refer to Section 3.2.14).

Based on RLS cultural data, resources identified within 5 miles of Segment 4 that potentially would be affected visually include numerous residential and commercial buildings, waterworks, and historic transportation corridors associated with the community of Huntington (including the Huntington Survey District) and the Vale Irrigation District. Additional resources include one unidentified Goal 5 Resource and "Emigrant Graves" (Goal 5 Resource) southeast of Huntington.

Applicant's Proposed Action Alternative

Cultural Resources Site Data

Eighty-one previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 54 pre-contact sites, 19 historic sites, 6 multi-component sites, and 2 sites of unknown temporal affiliation (Table 3-443). Of these sites, 4 are eligible for inclusion in the NRHP, 9 are not eligible, and 66 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. The remaining cultural resource represents one contributing segment of the Oregon NHT. Ten previously recorded sites have been identified in the direct effects APE.

Table 3-443. Summary of Cultural Resources Inventory Data for Segment 4—Brogan

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails /Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	3	0	1	9	0	0	42	17	5	2	1	1	81	1	10
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*
Tub Mountain South	12	3	0	8	0	4	56	24	5	5	4	1	122	2	9
Willow Creek	1	1	1	7	1	0	51	20	5	4	1	1	93	1	5

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

NRHP = National Register of Historic Places

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, cairns, and rock alignments. Historic site types include artifact scatters, cemeteries (Huntington and Lime-Dixie), buildings and structures, Oregon NHT-associated landmarks, one root cellar (Dixie Cellar), one kiln, one water tower, and several historic linear sites (canal and trail segments). The Oregon NHT is located in the direct effects APE. Multi-component site types include pre-contact lithic scatters/historic artifact scatters and pre-contact lithic and tool scatter/historic artifact scatters. The most commonly represented site types are pre-contact lithic scatters and pre-contact lithic and tool scatters.

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington and the Vale Irrigation District, resources that potentially would be affected visually, along this alternative route, include numerous historic buildings, structures, waterworks, and transportation corridors. The Applicant's Proposed Action Alternative is located approximately 1.6 miles to the west of the Huntington Survey District's western boundary. Historic resources associated with the Vale Irrigation District are located east of Link 4-70 in the indirect effects APE; these resources include the Bully Creek Dam and the Bully Creek Reservoir. Additional resources include one unidentified Goal 5 Resource and Emigrant Graves (Goal 5 Resource). The latter is located in the vicinity of this alternative route, just southeast of the Huntington Survey District.

National Historic Trails/Potential National Historic Trails

A previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of the Applicant's Proposed Action Alternative. South of the community of Dixie, one segment of the Oregon NHT travels southward just below the western foothills of the Morgan Mountain alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the trail have been identified near Huntington, in the indirect effects APE (refer to map MV-25 for inventory data). The Applicant's Proposed Action Alternative does not cross the Oregon NHT. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S4-A1

Sixteen previously recorded sites have been identified along Variation S4-A1, including 3 pre-contact sites, 12 historic sites, and 1 multi-component site (Table 3-443). Of these sites, 14 have not been evaluated for inclusion in the NRHP and 1 represents a contributing segment of the Oregon NHT. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. No previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters and cairns. Historic site types include cemeteries (Huntington and Lime-Dixie), buildings, one root cellar (Dixie Cellar), one kiln (Langely), one water tower, Oregon-NHT-associated landmarks, and one historic linear site (Oregon NHT). The multi-component site type is a pre-contact lithic scatter/historic artifact scatter.

One previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of Variation S4-A1. South of the communities of Weatherby and Dixie, the Oregon NHT travels southward just below the western foothills of the Morgan Mountain, and

alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the Oregon NHT have been identified near Huntington in the indirect effects APE (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington, resources that potentially would be affected visually, along this route variation, include numerous historic buildings and structures. Variation S4-A1 is located approximately 1.6 miles to the west of the Huntington Survey District's western boundary. Additional resources include one unidentified Goal 5 Resource and Emigrant Graves (Goal 5 Resource). The latter is located just southeast of the Huntington Survey District.

Variation S4-A2

Although Variation S4-A1 and Variation S4-A2 do not share the same alignment (except for Link 4-1), they are in proximity to one another, and the same previously recorded sites are identified for both route variations (Table 3-443). No previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT (previously recorded and unrecorded segments) identified along this route variation are the same as those identified along Variation S4-A1, since the two route variations follow similar alignments in proximity to the trail (refer to map MV-25 for inventory data).

Although Variation S4-A2 and Variation S4-A1 do not share the same alignment, they are in proximity to one another, and the same resources that potentially would be affected visually along Variation S4-A2 are the same as those identified along Variation S4-A1.

Variation S4-A3

Although Variation S4-A1 and Variation S4-A3 do not share the same alignment (except for Link 4-11), they are in proximity to one another, and the same previously recorded sites are identified for both route variations (Table 3-443). No previously recorded sites have been identified in the direct effects APE.

Segments of the Oregon NHT (previously recorded and unrecorded segments) identified along this route variation are the same as those identified along Variation S4-A1, since the two route variations follow similar alignments in proximity to the trail (refer to map MV-25 for inventory data).

Although Variation S4-A3 and Variation S4-A1 do not share the same alignment, they are in proximity to one another, and the same resources that potentially would be affected visually along Variation S4-A3 are the same as those identified along Variation S4-A1.

Tub Mountain South Alternative

Cultural Resources Site Data

A total of 122 previously recorded sites have been identified along the Tub Mountain South Alternative, including 76 pre-contact sites, 32 historic sites, 9 multi-component sites, and 5 sites of unknown

temporal affiliation (41 more sites than the Applicant's Proposed Action Alternative) (Table 3-443). Of these sites, 19 are eligible for inclusion in the NRHP, 8 are not eligible, and 90 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP. The remaining four cultural resources represent multiple contributing segments of the Oregon NHT. Nine previously recorded sites have been identified in the direct effects APE.

Of the 122 previously recorded sites identified along the Tub Mountain South Alternative, 45 sites occur in those areas where the alternative route and the Applicant's Proposed Action share the same alignment (from Dixie Creek to Durbin Creek, northwest of Huntington) or intersect (near Bully Creek). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic scatters, lithic and tool scatters, lithic procurement areas, human burial sites, rock features (cairns and rock alignments), campsites, one ceramic scatter, one possible game trap, and one rockshelter. Historic site types include artifact scatters, buildings and structures, homesteads, one station (Olds Ferry Railroad Station), cemeteries (Huntington and Lime-Dixie), one rock alignment, one root cellar (Dixie Cellar), one kiln (Langely), one water tower, Oregon NHT-associated landmarks (including Farewell Bend State Park), and historic liner sites (canal, railroad, and trail segments). Multi-component site types include pre-contact lithic scatters/historic artifact scatters, pre-contact lithic tool scatter/historic artifact scatters, one pre-contact artifact scatter/homestead, and one pre-contact campsite/foundation. Several rock features of unknown temporal affiliation also were identified along this alternative route. The most commonly represented site types are pre-contact lithic scatters and pre-contact lithic and tool scatters.

The Sand Dunes site, the OSL, the Vale Oregon Main Canal, the Oregon NHT, and the Olds Ferry Road Study Trail are located along this alternative route. Of these sites, only the Vale Oregon Main Canal is in the direct effects APE. The Tub Mountain South Alternative crosses the Oregon NHT (five unrecorded, intact segments) multiple times (refer to map MV-25 for inventory data).

There are known cultural resources near the Tub Mountain, the Snake River, Huntington, and the Long Tom Creek area. In addition, several resources of Native American concern (including Farewell Bend) have been identified along this alternative route (refer to Section 3.2.14). This alternative route passes within 1 mile of Farewell Bend.

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington and the Vale Irrigation District, resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from Dixie Creek to Durbin Creek) or intersect (near Bully Creek). The Tub Mountain South Alternative is located approximately 1.1 miles to the west of the Huntington Survey District's western boundary. The Vale Irrigation District is located west of Link 4-75 (southeast of the Tub Mountain in Malheur County).

National Historic Trails/Potential National Historic Trails

One previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of the Tub Mountain South Alternative. South of the community of Dixie, one segment of the Oregon NHT travels southward just below the western foothills of the Morgan Mountain, alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the trail have been identified near Huntington, in the indirect effects APE (refer to map MV-25 for inventory data).

Southeast of Huntington, the alternative route (Link 4-75) intersects five unrecorded, intact segments of the Oregon NHT (refer to map MV-25 for inventory data). Previously recorded segments of the trail also have been identified in the direct effects APE to the east of the alternative route (Alkali Springs and Birch Creek segments). These segments of the Oregon NHT were evaluated as contributing to the overall NRHP eligibility of the Oregon NHT.

The following trail-associated sites are located along the Tub Mountain South Alternative, in the indirect effects APE: Pioneer Graves, Farewell Bend, Olds Ferry Site, Birch Creek Site, Tub Springs, and Mud Springs.

One previously recorded segment of the Olds Ferry Road Study Trail (unevaluated) is located east of Link 4-17, in the indirect effects APE (refer to map MV-26 for inventory data). The historic trail follows the eastern bank of the Snake River from Eaton to Farewell Bend (location of Olds Ferry), Idaho, before crossing the Snake River to join the main route of the Oregon NHT (Oregon side of the Snake River). One additional segment of the trail is located in the indirect effects APE (northwest of Huntington). The Olds Ferry Road Study Trail is under study by the NPS, and is to be added to the Oregon NHT. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Willow Creek Alternative

Cultural Resources Site Data

Ninety-three previously recorded sites have been identified along the Willow Creek Alternative, including 59 pre-contact sites, 24 historic sites, 6 multi-component sites, and 4 sites of unknown temporal affiliation (12 more sites than the Applicant's Proposed Action Alternative) (Table 3-443). Of these sites, 3 are eligible for inclusion in the NRHP, 8 are not eligible, and 80 have not been evaluated. One cultural resource (Oregon Commercial Company Building [Huntington Survey District]) is listed in the NRHP (indirect effects APE). The remaining cultural resource represents a contributing segment of the Oregon NHT. Five previously recorded sites have been identified in the direct effects APE.

Of the 93 previously recorded sites identified along the Willow Creek Alternative, 68 sites occur in those areas where the alternative route and the Applicant's Proposed Action share the same alignment (northwest of Huntington and southwest of Hope Flat). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic scatters, lithic and tool scatters, cairns, rock alignments, and one rock images locale. Historic site types include artifact scatters, buildings and structures, cemeteries

(Huntington, Lime-Dixie, and Dell), one root cellar (Dixie Cellar), one railroad berm, one kiln (Langely), one water tower, one rock alignment, Oregon NHT-associated landmarks, and historic linear sites (canal, road, and trail segments). Multi-component site types include pre-contact lithic scatters/historic artifact scatters and pre-contact lithic tool scatter/historic artifact scatters. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, and pre-contact cairns and rock alignments.

The Oregon NHT (Goal 5 Segment) and the Dalles-Boise Military Road (noncontributing segment) are located along this alternative route, in the indirect effects APE. One pre-contact cairn and one historic rock alignment of unknown function are in the direct effects APE. The Willow Creek Alternative does not cross the Oregon NHT. One area of Native American concern (Striped Mountain) has been identified along this alternative route (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Huntington and the Vale Irrigation District, resources that potentially would be affected visually along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from Dixie Creek to Durbin Creek, northwest of Huntington and southwest of Hope Flat).

National Historic Trails/Potential National Historic Trails

One previously recorded segment of the Oregon NHT (Goal 5 Segment) has been identified in the indirect effects APE to the east of the Willow Creek Alternative. South of the community of Dixie, one segment of the Oregon NHT travels southward just below the western foothills of the Morgan Mountain, alongside the I-84 corridor. This segment of the trail was evaluated as contributing to the overall NRHP eligibility of the Oregon NHT. Unrecorded segments of the trail have been identified near Huntington, in the indirect effects APE (refer to map MV-25 for inventory data). For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 5—MALHEUR

There are 112 previously recorded sites along Segment 5; these include 75 pre-contact sites, 30 historic sites, and 7 multi-component sites (pre-contact and historic components). Of these sites, 12 are eligible for inclusion in the NRHP, 6 are not eligible, and 94 have not been evaluated. These results are summarized in Table 3-444, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Table 3-444. Summary of Cultural Resources Inventory Data for Segment 5—Malheur

Alternative Route	Number of Previously Recorded Sites in The Study Corridor1												National Historic Trails /Study Trails3	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of the Oregon National Historic Trail2	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component					
Applicant's Proposed Action	2	6	0	1	3	0	32	13	2	0	0	59	1	22
Variation S5-A1	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*
Variation S5-A2	*0*	*1*	*0*	*0*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*4*	*0*	*0*
Variation S5-B1	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*4*
Variation S5-B2	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*3*
Malheur S	1	8	2	1	4	0	67	13	4	0	0	100	1	15
Malheur A	1	7	2	1	4	0	59	13	4	0	0	91	1	16

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[3]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance

NRHP = National Register of Historic Places

Numerous significant cultural resources are present in Segment 5; these include the Oregon NHT (east of the study corridor), and heavily disturbed segments of the Meek Cutoff Study Trail. Additional resources include pre-contact and historic cairns, pre-contact rock alignments, pre-contact rockshelters, pre-contact lithic procurement areas, work camps, canals (Vale, North, and South canals), ditches, and water control features. Overall, the historic period resources along Segment 5 are largely associated with water control and conveyance; pre-contact resources are mostly associated with procurement and processing of lithic raw materials.

Based on RLS cultural data, resources identified within 5 miles of Segment 5 that potentially would be affected visually include numerous water control features, ditches, and canal associated with the Owyhee Dam Historic District. The Owyhee Dam Historic District was listed in the NRHP in 2010 (Rogers and Pfaff 2010).

Applicant's Proposed Action Alternative

Cultural Resources Site Data

Fifty-nine previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 35 pre-contact sites, 22 historic sites, and 2 multi-component sites (Table 3-444). Of these sites, 8 are eligible for inclusion in the NRHP, 4 are not eligible, and 47 have not been evaluated. Twenty-two previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, campsites, and one cairn. Historic site types include artifact scatters, one habitation structure, one prospect, and several historic linear sites (ditch, canal, and trail segments). Multi-component site types include one pre-contact campsite/historic artifact scatter and one pre-contact lithic scatter/shed. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, and irrigation canals and ditches.

The Kingman Lateral, the North Canal, the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail are in the direct effects APE; these sites are crossed by the Applicant's Proposed Action Alternative. Numerous pre-contact lithic scatters, pre-contact lithic and tool scatters, and historic artifact scatters, also are crossed by this alternative route. There is the potential for direct effects on undocumented, significant sites along this route, primarily along the Malheur and Owyhee river crossings.

Based on RLS cultural data collected for alternative routes in the vicinity of Owyhee Dam Historic District (NRHP-listed), resources that potentially would be affected visually, along this alternative route, include numerous historic water control features, ditches, and canals. Of the alternative routes considered for Segment 5, the Applicant's Proposed Action Alternative lies farther from the historic district.

National Historic Trails/Potential National Historic Trails

The Applicant's Proposed Action Alternative avoids the Oregon NHT. The closest segment of the trail (Southern Alternate Route of the Oregon NHT) is located approximately 4.7 miles east from Link 5-70, outside of the study corridor (Oregon – Idaho state border).

The Applicant' Proposed Action Alternative (Link 5-5) crosses one previously recorded segment of the Meek Cutoff Study Trail approximately 4 miles north of Vines Hill. There, the trail runs alongside the Malheur River in Malheur County. This segment of the trail was evaluated as noncontributing to the overall NRHP eligibility of the Meek Cutoff Study Trail. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Variation S5-A1

Two sites have been identified along Variation S5-A1, including one historic habitation site and one historic artifact scatter (Table 3-444). One of the sites is eligible for the NRHP and one is not eligible. No previously recorded sites have been identified in the direct effects APE.

Variation S5-A2

Four previously recorded sites have been identified along Variation S5-A2, including three historic sites and one multi-component site (two more sites than Variation S5-A1) (Table 3-444). Sites identified along Variation S5-A2, but not along Variation S5-A1, include one historic artifact scatter and one pre-contact lithic scatter/historic artifact scatter. No previously recorded sites have been identified in the direct effects APE.

Variation S5-B1

Seven sites have been identified along Variation S5-B1, including two pre-contact sites and five historic sites (Table 3-444). Of these sites, one is eligible for inclusion in the NRHP and six have not been evaluated. Four previously recorded sites have been identified in the direct effects APE.

Site types include pre-contact lithic and tool scatters, historic artifact scatters, and historic linear sites (Kingman Lateral, North Canal, and Owyhee Ditch). Of these sites, the Kingman Lateral and the North Canal are in the direct effects APE, and are crossed by this route variation. There is the potential for direct effects on undocumented, significant sites along this route variation, primarily along the Owyhee River crossing.

Variation S5-B2

Previously recorded sites identified along Variation S5-B2 are the same as those identified along Variation S5-B1 (Table 3-444). Sites are the same because they occur near an area where the two route variations become closer to one another or intersect. Three of the sites have been identified in the direct effects APE.

As identified for Variation S5-B1, there is the potential for direct effects on undocumented, significant sites along the Owyhee River crossing.

Malheur S Alternative

Cultural Resources Site Data

A total of 100 previously recorded sites have been identified along the Malheur S Alternative, including 69 pre-contact sites, 25 historic sites, and 6 multi-component sites (41 more sites than the Applicant's Proposed Action Alternative) (Table 3-444). Of these sites, 11 are eligible for inclusion in the NRHP, 5 are not eligible, and 84 have not been evaluated. Fifteen previously recorded sites have been identified in the direct effects APE.

Of the 100 previously recorded sites identified along the Malheur S Alternative, 49 sites occur in those areas where the alternative route and the Applicant's Proposed Action share the same alignment (from Bully Creek to the U.S. Highway 20) or intersect (near Succor Creek). In between those two areas, the alternative routes differ significantly.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, lithic procurement areas, rockshelters, campsites, one cairn, and one structural site/rock alignment of unknown function. Historic site types include artifact scatters, mines and prospects, one survey marker, one work camp

(government camp), one habitation structure, and several historic linear sites (ditch, canal, and trail segments). Multi-component site types include pre-contact campsites/historic artifact scatters, pre-contact lithic scatter/homestead, pre-contact lithic and tool scatter/homestead, and one pre-contact lithic scatter/shed. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, historic artifact scatters, and irrigation canals and ditches.

The North Canal, South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail are located along this alternative route. Of these historic linear sites, the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail are in the direct effects APE, and also are crossed by this alternative route. Several pre-contact lithic scatters are crossed by the Malheur S Alternative.

There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Malheur River crossings. The Malheur S Alternative passes through an area (Negro Rock Canyon) of Native American concern (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Owyhee Dam Historic District (NRHP-listed), resources that potentially would be affected visually along this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. The Malheur S Alternative is significantly closer to the Owyhee Dam Historic District. The alternative route is located approximately 1.4 miles to the northeast of the historic district's northeastern boundary.

National Historic Trails/Potential National Historic Trails

The Malheur S Alternative avoids the Oregon NHT. The closest segment of the trail (Southern Alternate Route of the Oregon NHT) is located approximately 6 miles east from Link 5-75, outside of the study corridor (Oregon – Idaho state border).

Both the Malheur S Alternative and the Applicant's Proposed Action Alternative cross the same segment of the Meek Cutoff Study Trail (previously recorded, noncontributing segment), since the two alternative routes shared the same alignment in proximity to the trail. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

Malheur A Alternative

Cultural Resources Site Data

Ninety-one previously recorded sites have been identified along the Malheur A Alternative, including 61 pre-contact sites, 24 historic sites, and 6 multi-component sites (nine fewer sites than the Malheur S Alternative) (Table 3-444). Because the affected environment for the Malheur A Alternative would be similar to the Malheur S Alternative, these two alternative routes are compared.

Sites identified along the Malheur S Alternative, but not along the Malheur A Alternative, include eight pre-contact sites (lithic and artifact scatters, lithic and tool scatters, and rockshelter) and one historic site (North canal). The differences in the number of sites occur along Link 5-35 (north of the Grassy Mountain area). Sixteen previously recorded sites have been identified in the direct effects APE.

Of the 91 previously recorded sites identified along this alternative route, 10 are eligible for inclusion in the NRHP, 5 are not eligible, and 76 have not been evaluated. The most commonly represented site types are pre-contact lithic and artifact scatters, pre-contact lithic and tool scatters, and irrigation ditches and canals.

The Malheur A Alternative crosses the same sites as the Malheur S Alternative because these alternative routes share the same alignment or follow similar alignments, passing in proximity to the same resources. There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Malheur and Owyhee river crossings. Both alternative routes pass through an area (Negro Rock Canyon) of Native American concern (refer to Section 3.2.14).

Based on RLS cultural data collected for alternative routes in the vicinity of Owyhee Dam Historic District (NRHP-listed), resources that potentially would be affected visually along this alternative route are similar to those identified along the Malheur S Alternative, except that the Malheur A Alternative encompasses a portion of the Owyhee Dam Historic District.

National Historic Trails/Potential National Historic Trails

The Malheur A Alternative avoids the Oregon NHT. The closest segment of the trail (Southern Alternate Route of the Oregon NHT) is located approximately 6.4 miles east from Link 5-35, outside of the study corridor (Oregon – Idaho state border).

Both the Malheur A Alternative and the Applicant's Proposed Action Alternative cross the same segment of the Meek Cutoff Study Trail (previously recorded, noncontributing segment), since the two alternative routes shared the same alignment in proximity to the trail. For further information regarding NHTs and Study Trails, refer to Section 3.2.15.

SEGMENT 6—TREASURE VALLEY

There are 178 previously recorded sites along Segment 6; these include 110 pre-contact sites, 50 historic sites, 15 multi-component sites (pre-contact and historic components), and 3 sites of unknown temporal affiliation. Of these sites, 14 are eligible for inclusion in the NRHP, 22 are not eligible, and 139 have not been evaluated. Two cultural resources (Bernard's Ferry and Poison Creek Stage Station) are listed in the NRHP. The remaining resource represents one contributing segment of the Southern Alternate Route of the Oregon NHT. These results are summarized in Table 3-445, and organized by alternative routes and route variations. This table represents previously recorded sites with definitive physical manifestations and/or cultural materials revealed by cultural resource pedestrian surveys.

Numerous significant cultural resources are present in Segment 6; these include the previously mentioned NRHP-listed historic period properties, the WWII Marsing Bomb Range, the Wilson Cemetery, the old U.S. Highway 95, and the Southern Alternate Route of the Oregon NHT. Additional resources include the Alkali Springs Site (pre-contact village/campsite with a Paleoindian component), pre-contact human burial sites, pre-contact cairns, pre-contact rock alignments, numerous pre-contact habitation sites (rockshelters), rock features of unknown temporal affiliation, wagon roads, canals, ditches, mining claims, and scattered historic buildings.

Table 3-445. Summary of Cultural Resources Inventory Data for Segment 6—Treasure Valley

Alternative Route	Number of Previously Recorded Sites in The Study Corridor[1]													National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects
	NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites		
	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]					
Applicant's Proposed Action	6	5	3	7	15	0	94	27	12	3	1	2	175	1	26
Variation S6-A1	*3*	*3*	*1*	*1*	*3*	*0*	*33*	*0*	*7*	*0*	*0*	*1*	*52*	*0*	*15*
Variation S6-A2	*3*	*3*	*1*	*1*	*3*	*0*	*30*	*0*	*7*	*0*	*0*	*1*	*49*	*0*	*7*
Variation S6-B1	*5*	*5*	*2*	*3*	*10*	*0*	*60*	*16*	*6*	*3*	*1*	*1*	*112*	*1*	*10*
Variation S6-B2	*5*	*5*	*2*	*3*	*10*	*0*	*57*	*16*	*6*	*3*	*1*	*1*	*109*	*1*	*8*

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]The Southern Alternate Route of the Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

NRHP = National Register of Historic Places

Based on RLS cultural data, pre-contact sites are frequent in this portion of the study corridor, and include several prominent petroglyph locations, particularly the NRHP-listed Map Rock Petroglyphs Historic District. Additional resources include pre-contact habitation structures (large semi-subterranean pithouses) associated with the Givens Hot Springs area (southern end of the study corridor). As previously mentioned, the Givens Hot Springs also is a historic resource associated with the Oregon NHT (Southern Alternate Route). The NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area are located in the vicinity of the study corridor.

Applicant's Proposed Action Alternative

Cultural Resources Site Data

A total of 175 previously recorded sites have been identified along the Applicant's Proposed Action Alternative, including 107 pre-contact sites, 50 historic sites, 15 multi-component sites, and 3 sites of unknown temporal affiliation (Table 3-445). Of these sites, 14 are eligible for inclusion in the NRHP, 22 are not eligible, and 136 have not been evaluated. Two sites (Bernard's Ferry and Poison Creek Stage Station) are listed in the NRHP. The remaining cultural resource represents a contributing segment of the Oregon NHT. Twenty-six previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, human burial sites, lithic procurement areas, cairns, rock alignments, campsites, rockshelters, one processing station, and one pre-contact village/campsite with a Paleoindian component (Alkali Springs Site). Historic site types include artifact scatters, homesteads, buildings and habitation structures (farming/ranching-related sites), livestock enclosures, inscriptions, mine and prospects, the WWII Marsing Bomb Range, one stage station (NRHP-listed Poison Creek Stage Station), one campsite, one cemetery (Wilson), one water trough, and several historic linear sites (utility line, ditch, canal, road, ferry, and trail segments). Multi-component site types include pre-contact lithic scatters/historic artifact scatters, pre-contact lithic scatters/mining-related sites, pre-contact lithic scatter/prospect, pre-contact lithic scatter/field range, pre-contact lithic procurement area/historic artifact scatter, pre-contact rockshelter/inscriptions, and one campsite/Civilian Conservation Corps Project. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact rockshelters, pre-contact campsites, and historic artifact scatters.

The NRHP-listed Bernard's Ferry, the Beck Irrigation Ditch, the South Canal, the old U.S. Highway 95, and the Southern Alternate Route of the Oregon NHT are located along this alternative route. Of these sites, the Beck Irrigation Ditch, the South Canal, and the old U.S. Highway 95 are in the direct effects APE, and are crossed by the Applicant's Proposed Action Alternative. One pre-contact lithic scatter and three multi-component sites also are crossed by this alternative route.

One sensitive area, Graveyard Point, has been identified as a historic resource, along this alternative route. This area also is important to Native American tribes. Graveyard Point is in the indirect effects APE (refer to Section 3.2.14).

Based on RLS cultural data, resources identified within 5 miles of this alternative route that potentially would be affected visually include the NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. The Map Rock Petroglyphs Historic District, in the Givens Hot Springs area, contains 20 etched volcanic boulders containing numerous different designs (Davis and Swanson n.d.). These resources are located in the vicinity of the study corridor (Link 6-25), near the Snake River southwest of Melba. There is the potential to encounter undocumented, significant pre-contact sites near the Givens Hot Springs area. As previously mentioned, the Givens Hot Springs also is a historic resource associated with the Oregon NHT (Southern Alternate Route).

National Historic Trails/Potential National Historic Trails

The Southern Alternate Route of the Oregon NHT is located in and near the study corridor from the Oregon – Idaho state border to Guffrey Butte, where the historic trail parallels the Snake River. The historic trail is located in the indirect effect APE from Givens Hot Springs (trail-related resource) to the intersection of Reynolds Creek Road and SR 78, east of Hemingway Butte, where the trail (contributing segment) closely parallels the western bank of the Snake River. Segments of the historic trail are located approximately 0.8 mile east of Link 6-35 (closest distance). The Givens Hot Springs area is located in the vicinity of the study corridor.

Variation S6-A1

Fifty-two sites have been identified along Variation S6-A1, including 37 pre-contact sites, 7 historic sites, and 8 multi-component sites (Table 3-445). Of these sites, 7 are eligible for inclusion in the NRHP, 4 are not eligible, and 40 have not been evaluated. One cultural resource (Poison Creek Stage Station) is listed in the NRHP. Fifteen previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic and artifact scatters, lithic and tool scatters, lithic procurement areas, rockshelters, cairns, one rock alignment, and one processing station. Historic site types include artifact scatters, one mine, one homestead, one stage station (NRHP-listed Poison Creek Stage Station), and one historic linear site (South Canal). Multi-component sites include pre-contact lithic scatters/mining-related sites, pre-contact campsite/historic artifact scatter, pre-contact lithic procurement areas/historic artifact scatters, and one pre-contact lithic scatter/shed. The most commonly represented site types are pre-contact lithic scatters.

The South Canal and several pre-contact lithic scatters are located in the direct effects APE. The historic canal is crossed by the route variation. The NRHP-listed Poison Creek Stage Station and Graveyard Point have been identified along this route variation, in the indirect effects APE.

Variation S6-A1 avoids the Southern Alternate Route of the Oregon NHT. The closest segment of the trail (previously recorded, contributing segment) is located approximately 6.3 miles east from Link 6-20.

Variation S6-A2

Forty-nine previously recorded sites have been identified along Variation S6-A2, including 34 pre-contact sites, 7 historic sites, and 8 multi-component sites (three fewer sites than Variation S6-A1)

(Table 3-445). Sites identified along Variation S6-A1, but not along Variation S6-A2, include three pre-contact sites (lithic scatters and rockshelter). Variation S6-A2 is closer to most of the previously recorded sites than Variation S6-A2 (primarily east of Link 6-5). Seven previously recorded sites have been identified in the direct effects APE.

Three pre-contact lithic procurement areas, one pre-contact rockshelter, and the NRHP-listed Poison Creek Stage Station are located in the direct effects APE.

Variation S6-A2 is closer to Graveyard Point (historic resource and Native American concern) than Variation S6-A1 (refer to Section 3.2.14).

Variation S6-A2 avoids the Southern Alternate Route of the Oregon NHT. Previously recorded, contributing segments of the historic trail are situated farther to the east.

Variation S6-B1

A total of 112 previously recorded sites have been identified along Variation S6-B1, including 68 pre-contact sites, 33 historic sites, 8 multi-component sites, and 3 sites of unknown temporal affiliation (Table 3-445). Of these sites, 12 are eligible for inclusion in the NRHP, 13 are not eligible, and 85 have not been evaluated. One site (Poison Creek Stage Station) is listed in the NRHP. The remaining cultural resource represents a contributing segment of the Oregon NHT. Most of the previously recorded sites occur east of Link 6-10. Ten previously recorded sites have been identified in the direct effects APE.

Pre-contact site types include lithic scatters, lithic and tool scatters, human burial sites, lithic procurement areas, campsites, cairns, rock alignments, rockshelters, and one pre-contact village/campsite with a Paleoindian component (Alkali Springs Site). Historic site types include artifact scatters, prospects, inscriptions, one stage station (NRHP-listed Poison Creek Stage Station), the WWII Marsing Bomb Range, one habitation, one homestead, one campsite, one water trough, one cairn, and several historic linear sites (utility line, canal, road, and trail segments). Multi-component sites include pre-contact lithic scatters/historic artifact scatter, one pre-contact lithic scatter/prospect, one pre-contact cairn/prospect, one pre-contact lithic scatter/shed, and one pre-contact rockshelter/inscriptions. The most commonly represented site types are pre-contact lithic scatters, pre-contact lithic and tool scatters, pre-contact rockshelters, pre-contact campsites, and historic artifact scatters.

The Beck Irrigation Ditch, the South Canal, the old U.S. Highway 95, and the Southern Alternate Route of the Oregon NHT are located along this route variation. Of these sites, the old U.S. Highway 95 is in the direct effects APE, and is crossed by this route variation. One pre-contact campsite and one multi-component site (pre-contact rockshelter/historic inscriptions) also are in the direct effects APE. The NRHP-listed Poison Creek Stage Station is in the indirect effects APE.

Based on RLS cultural data collected for the Applicant's Proposed Action Alternative, resources that potentially would be affected visually, along this route variation, include NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. These resources are located in the

vicinity of Variation S6-B1, near the Snake River southwest of Melba. Numerous pre-contact rock images, pre-contact human burial sites and grave goods, and pre-contact campsites have been identified along this route variation (primarily along the Snake River). There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area.

Variation S6-B1 (eastern end) is located approximately 1.9 miles west from the Southern Alternate Route of the Oregon NHT (previously recorded, contributing).

Variation S6-B2

A total of 109 previously recorded sites have been identified along Variation S6-B2, including 65 pre-contact sites, 33 historic sites, 8 multi-component sites, and 3 sites of unknown temporal affiliation (three fewer sites than Variation S6-B1) (Table 3-445). Sites identified along Variation S6-B1, but not along Variation S6-B2, include six pre-contact sites (lithic scatters, rockshelter, and campsite). Three pre-contact sites (lithic scatter and lithic and tool scatter) identified along Variation S6-B2 are not located within the study corridor for Variation S6-B1. Eight previously recorded sites have been identified in the direct effects APE.

One pre-contact cairn and one rockshelter are located in the direct effects APE. The NRHP-listed Poison Creek Stage Station is located in the indirect effects APE.

Variation S6-B2 (eastern end) is located approximately 1.9 miles west from the Southern Alternate Route of the Oregon NHT (previously recorded, contributing).

Based on RLS cultural data collected for the Applicant's Proposed Action Alternative, resources that potentially would be affected visually along this route variation are the same as those identified along Variation S6-B1. Variation S6-B2 is slightly closer to resources associated with the NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area.

3.2.13.6 Environmental Consequences (Results of Analysis)

Type of Potential Effects

The construction, operation, and maintenance of the B2H Project potentially would result in both direct and indirect effects on cultural resources. An adverse effect occurs when an undertaking alters, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Any adverse effects on historic properties under Section 106 of the NHPA would be mitigated as stipulated in the Programmatic Agreement (Appendix I), except on Navy property. The BLM, in consultation with the SHPO/THPO, may propose a finding of no adverse effect when an undertaking's effects do not meet the criteria of adverse effect or the undertaking is modified or conditions are imposed to avoid adverse effects.

The types of potential impacts on cultural resources include:

- Direct and permanent ground disturbance of cultural resources resulting in damage to intact surface and subsurface cultural materials, such as artifacts and features, during construction of access roads, ancillary facilities, and tower locations
- Direct and indirect long-term visual, atmospheric, and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility
- Direct and indirect permanent disturbance of cultural resources due to changes in public accessibility (e.g., unauthorized use of access roads)

It is important to note that the direct and indirect effects APEs are indicative of physical areas of disturbance in which resources may be affected directly or indirectly by the construction of the B2H Project and its associated features. The B2H Project APEs typically are based on distance zones centered on construction rights-of-way. This analysis is not meant to be reflective of impact zones related to ground disturbance.

Direct effects on cultural resources identified in the RLS, as requiring further analysis, will be determined during the ILS. Analysis of indirect effects will occur following the process outlined in the visual assessment of historic properties workplan, which will be appended to the POD. Direct effects on cultural resources may be avoided through micro-siting of B2H Project elements, such as towers, pulling and tensioning areas, roads, and substation structures. However, it is important to note that avoidance of direct effects through micro-siting and monitoring of construction activities would not account for indirect effects that may result from increased access and future operation and maintenance of the B2H Project. Avoidance is the preferred method to eliminate or reduce adverse effects on historic properties.

Under each segment is a discussion of the analysis of potential impacts on cultural resources associated with each alternative route and route variation. Table 3-446 through Table 3-451 present the numbers of previously recorded sites within each 4-mile-wide study corridor based on previously surveyed areas and cultural resources sensitivity for each alternative route and route variation in the study corridor. Cultural resource sensitivity, for each alternative route and route variation, is reported in combined miles of low, moderate, and high sensitivity. Based on the nature and significance of the cultural resources present along the study corridor, and the calculated mileages of cultural resource sensitivity, an overall assessment of cultural resource sensitivity has been assigned for each alternative route and route variation. As previously mentioned, cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segments of NHTs or Study Trails) are not included in the quantitative analysis. These significant resources are discussed qualitatively under each alternative route discussion.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Applicant's rights-of-way application to develop the B2H Project under the Proposed Action would not be approved. The B2H Project would not be developed and the environment would remain as it presently exists.

EFFECTS COMMON TO ALL ALTERNATIVES

Potential impacts on sites in the direct effects APE could include direct and permanent ground disturbance associated with the construction of tower locations, ancillary facilities, and access roads; and direct and indirect permanent disturbance due to changes in public accessibility (i.e., the introduction of new or improved access roads). Potential impacts on sites in the indirect effects APE could include direct and indirect permanent disturbance due to changes in public accessibility; and direct and indirect long-term visual, atmospheric, and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility. These types of disturbance could damage or destroy cultural resources if not mitigated.

The potential for the discovery of unanticipated cultural resources during construction, construction monitoring, or operation and maintenance activities of the B2H Project exists in the direct effects APE and could result in adverse effects. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the resources involved. Displacement of cultural resources affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Any cultural resources, human remains or funerary objects discovered at any time during construction, construction monitoring, or operation and maintenance activities will be treated in accordance with the Inadvertent Discovery Plan contained in the HPMP.

To date, the number of cultural resources that could be adversely affected by the B2H Project is unknown. Once an alternative has been selected, a complete Class III intensive pedestrian inventory would be conducted along the entire route and all roads and facilities as part of the Class III study. All sites in the direct effects APE would be documented and evaluated for eligibility for the NRHP, and sites located in the indirect effects APE that meet the criteria established for potential visual sensitivity also would be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, Native American sovereign tribal governments participating in the B2H Project, and the SHPOs, who would then determine if the B2H Project has the potential to have an adverse effect on historic properties. Prior to construction activities in the area, any adverse effects on historic properties would need to be resolved per 36 CFR Part 800.6. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property (Segment 1). The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Note that cultural resource site-specific impacts cannot be identified or quantified at this stage in B2H Project development; therefore, discussions are focused on the types of potential impacts that sites along specific alternative routes and route variations could be subject to, based on sensitivity calculations for those routes. Sensitivity calculations are provided as a means for comparison of alternative routes and route variations using existing data for analysis. Although miles of cultural resource sensitivity do not directly correlate with an equal number of miles of impacts on cultural resources; it is an index for comparison. These calculations are used to identify potential initial impacts on known cultural resources related to implementation of the B2H Project without avoidance or other

mitigation planning that would be addressed in the HPMP. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes, unrecorded segments of NHTs, unrecorded segment of Study Trails) are not included in these calculations. These resources are therefore characterized in a qualitative manner under each alternative route discussion. For further information regarding the cultural-analysis method, refer to effects analysis in Section 3.2.13.4.

SPECIFIC IMPACTS RELATED TO CONSTRUCTION, OPERATIONS, AND MAINTENANCE

Construction of the B2H Project and its ancillary facilities could directly affect existing cultural resources. Construction or other ground-disturbing activities could directly or indirectly affect previously unidentified cultural resources (primarily buried resources). Such impacts are likely to be adverse. Increased use of existing and new access roads may encourage unauthorized site access, illicit artifact collection, and vandalism. Vibration from construction equipment and construction activities (such as blasting or drilling) may affect cultural resources, especially historic resources with standing architecture or pre-contact rockshelters. Impacts on the setting and feeling of cultural resources may be introduced through the addition of the B2H Project's structural elements to the landscape. Construction of transmission line structures may introduce indirect (visual) effects on existing cultural resources, especially historic trails and sites of Native American concern. Because of the existence of the Oregon NHT and trails under study for NHT designation in the B2H Project area, an analysis of impacts on these significant resources is addressed separately in Section 3.2.15.

Once the B2H Project has been constructed, the presence of large transmission line structures may introduce long-term impacts on the setting of certain cultural resources, particularly those sensitive to changes in the visual field, including intact segments of NHTs, historic properties of religious and cultural significance to Indian tribes, and cultural landscapes.

Cultural resources, that are located in the study corridor, may be directly affected by use and improvement of access roads, and construction of pads for new transmission line structures and facilities.

Indirect effects could consist of increased off-road traffic, and therefore easier access to cultural resources, which could result in vandalism or inadvertent adverse effects. Auditory impacts may consist of transmission line "buzzing" or "humming" that could detract from the remote sense of feeling, contributing to the character of certain cultural resources such as NHTs, historic properties of religious and cultural significance to Indian tribes, and cultural landscapes.

Periodic access to the transmission line's rights-of-way is required to maintain its operating function. Thus, access roads would be kept open, at least at a two-track level, which increases the potential for vandalism and illicit artifact collection. Access roads could be gated (i.e., closed to the general public) as part of cultural mitigation, if near sensitive or vulnerable cultural resources, Continued use of access roads for maintenance may increase erosion, which could affect cultural resources located along the margins of roads. Other maintenance activities, such as vegetation removal, have the

potential to produce ground disturbance, which may, in turn, affect both previously identified and unidentified cultural resources.

SEGMENT 1—MORROW-UMATILLA

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 101 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 3 have been categorized as high sensitivity, 7 as moderate sensitivity, and 91 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the West Extension Irrigation Canal, and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 1.3 miles of high, 14 miles of moderate, and 39.9 miles of low cultural resource sensitivity. The remaining 36.7 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-446). Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes (CTUIR) in the NWSTF Boardman) identified along this alternative route. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along the Applicant's Proposed Action Alternative include the Oregon NHT (Well Spring Segment and the Lower Well Springs Diversion of the Well Spring Segment), trail-associated sites, the Interpretative Park-California Gulch of the Oregon NHT, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. Of these resources, only the NRHP-listed Well Spring Segment of the Oregon NHT is in the direct effects APE, and also is crossed by this alternative route. The Lewis and Clark NHT and the Study Trails are located in the vicinity of the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Additional key resources identified along this alternative route include the NWSTF Boardman and associated sites (including the two historic properties of religious and cultural significance to Indian tribes) and sites of Native American concern (e.g., sites near Pilot Rock, Sand Hollow Battlefield 1848, cairns, rock alignments, one culturally modified trees locale). These resources are located in or near the indirect effects APE, except for the two historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman (direct and indirect effects APEs). The Applicant's Proposed Action Alternative crosses through the McKay Creek area. The general area is considered sensitive for cultural resources (pre-contact and historic) and has been identified as being of importance to Native American tribes (refer to Section 3.2.14).

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the communities of Boardman and Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

There is one area (route's western extension [Links 1-1, 1-3, 1-7, and 1-27]) where the Applicant's Proposed Action Alternative is colocated with an existing transmission line.

Variation S1-B1

There is the potential for direct and/or indirect effects on 58 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S1-B1 (Table 3-446). Of these sites, 3 have been categorized as moderate sensitivity and 55 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S1-B1, there are 0.0 miles of high, 3.8 miles of moderate, and 2.6 miles of low cultural resource sensitivity (Table 3-446).

Key resources identified along Variation S1-B1 include the Oregon NHT (Blue Mountain Segment and unnamed segments of the trail), the Blue Mountain Crossing Interpretive Park site, the Interpretative Park-California Gulch, and sites of Native American concern (e.g., rock alignments, habitation structures, and one culturally modified trees locale). These cultural resources are in the indirect effects APE. There is the potential for direct effects on undocumented pre-contact sites along this route variation (specifically southeast of Kamela).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-B1 would be those identified as common to all alternatives. If Variation S1-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-446. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 1—Morrow to Umatilla

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]												National Historic Trails[3]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of Oregon National Historic Trail[2]	NRHP-listed Properties	Total Number of Previously Recorded Sites			Low	Moderate	High	None	Low	Moderate	High
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component												
Applicant's Proposed Action	91.9	6	10	0	1	20	0	17	41	2	3	1	101	1	11	91	7	3	36.7	39.9	14	1.3[5,6]
Variation S1-B1	*6.4*	*3*	*7*	*0*	*1*	*9*	*0*	*13*	*21*	*2*	*2*	*0*	*58*	*1*	*0*	*55*	*3*	*0*	*0.0*	*2.6*	*3.8*	*0.0*
Variation S1-B2	*6.4*	*3*	*7*	*0*	*0*	*9*	*0*	*11*	*21*	*2*	*2*	*0*	*55*	*1*	*1*	*49*	*5*	*1*	*0.0*	*1.3*	*4.8*	*0.3*
East of Bombing Range Road	92.3	7	10	0	1	19	0	17	41	2	3	1	101	1	12	91	7	3	36.7	40.4	13.9	1.3[5,6]
Applicant's Proposed Action – Southern Route	99.1	6	10	0	1	21	0	18	41	2	3	1	103	1	8	95	6	2	40.7	43.9	13.6	0.9[5]
West of Bombing Range Road – Southern Route	95.6	6	9	0	1	20	0	18	38	2	2	1	97	1	8	89	6	2	42.1	40.2	12.4	0.9[5,6]
Longhorn	88.2	4	8	0	1	12	0	15	35	2	4	0	81	1	10	72	5	4	42.2	31.6	13.0	1.4[6]
Interstate – 84	84.7	4	11	0	1	12	0	15	41	3	2	0	89	1	9	78	7	4	31.6	37.2	13.1	2.8[6,7]
Variation S1-A1	*18.5*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0*[4]	*0*	*5*	*1*	*0*	*15.8*	*1.3*	*1.4*	*0.0*[7]
Variation S1-A2	*18.5*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*4*	*1*	*0*	*0*	*6*	*0*[4]	*0*	*5*	*1*	*0*	*14.9*	*2.0*	*1.6*	*0.0*[7]
Interstate-84 – Southern Route	93.4	4	11	0	1	13	0	16	42	3	2	0	92	1	6	83	6	3	35.3	43	12.7	2.4[7]

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[3]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

[4]There are no previously recorded segments of the Oregon National Historic Trail along Variations S1-A1 and S1-A2. Based on NPS data, unrecorded segments of the Oregon NHT are crossed by Variations S1-A1 and S1-A2 (refer to map MV-25 for inventory data).

[5]Additional miles of high cultural resource sensitivity would be anticipated due to significant resources (two historic properties of religious and cultural significance to Indian tribes) with no spatial data along these alternative routes.

[6]Potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

[7]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT along these alternative routes and route variations (refer to map MV-25 for inventory data).

NRHP = National Register of Historic Places

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Variation S1-B2

There is the potential for direct and/or indirect effects on 55 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S1-B2 (three fewer sites than Variation S1-B1). Of these sites, 1 has been categorized as high sensitivity, 5 as moderate sensitivity, and 49 as low sensitivity (Table 3-446). The previously recorded site associated with a high sensitivity index is a historic sawmill. This previously recorded site is located further away from Variation S1-B1. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S1-B2 would be similar to Variation S1-B1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-446). A total of 0.3 mile of high cultural resource sensitivity is anticipated along this route variation compared to 0.0 mile along Variation S1-B1. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S1-B2.

Key resources identified along this route variation are the same as those identified along Variation S1-B1 because they occur in an area where the route variations are in proximity to one another. Potential impacts on the Oregon NHT would be similar to Variation S2-B1 except that Variation S1-B2 is located closer to the trail resulting in the potential for more intense impacts. The Oregon NHT is located in the indirect effects APE. There also is the potential for direct effects on undocumented historic transportation corridors along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-B2 would be those identified as common to all alternatives. If Variation S1-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Potential impacts under Design Option 1 would be similar to the western extent of the Applicant's Proposed Action Alternative (adjacent to the Bombing Range Road), since they follow similar alignments along this portion of the B2H Project area.

Key resources identified along Design Option 1 include the Well Spring Segment of the Oregon NHT, the Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. Of these resources, only the NRHP-listed Well Spring Segment of the Oregon NHT is in the direct effects APE, and also is crossed by this design option. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Additional key resources identified along this design option include Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes). Of these resources, the two historic

properties of religious and cultural significance to Indian tribes are in the direct and indirect effects APEs.

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Design Option 1 would be those identified as common to all alternatives. If Design Option 1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Design Option 2

Potential impacts under Design Option 2 would be similar to Design Option 1, since the two design options follow similar alignments along this portion of the B2H Project area. If there were any minor differences in mileages of cultural resource sensitivity, they would be present at the southern end of the design options.

Key resources identified along Design Option 2 are the same as those identified along Design Option 1, since these two design options follow similar alignments, passing in proximity to the same resources. Both design options follow similar alignments where the Well Spring Segment of the Oregon NHT is crossed. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Design Option 2 would be those identified as common to all alternatives. If Design Option 2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating on the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Design Option 3

Potential impacts under Design Option 3 would be similar to Design Option 1, since the two design options follow similar alignments along this portion of the B2H Project area. If there were any minor differences in mileages of cultural resource sensitivity, they would be present at the southern end of the design options.

Key resources identified along Design Option 3 are the same as those identified along Design Option 1, since these two design options follow similar alignments, passing in proximity to the same resources. Both design options follow similar alignments where the Well Spring Segment of the Oregon NHT is

crossed. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Design Option 3 would be those identified as common to all alternatives. If Design Option 3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating on the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

East of Bombing Range Road Alternative

Under the East of Bombing Range Road Alternative, there is the potential for direct and/or indirect effects on 101 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 3 have been categorized as high sensitivity, 7 as moderate sensitivity, and 91 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the West Extension Irrigation Canal, and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the East of Bombing Range Road Alternative would be similar to the Applicant's Proposed Action Alternative, except for minor variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 1.3 miles of high cultural resource sensitivity are anticipated in both alternative routes. These alternative routes have the potential for affecting the same number of previously recorded, high sensitivity sites. Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman) identified along the East of Bombing Range Road Alternative. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located along the east side of Bombing Range Road). Like the Applicant's Proposed Action Alternative, the East of Bombing Range Road Alternative also crosses the McKay Creek area and lies in proximity to historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman (direct effects APE).

The East of Bombing Range Road Alternative would have similar effects on the Well Spring Segment of the Oregon NHT and trail-associated sites as the Applicant's Proposed Action Alternative, since the two alternative routes follow similar alignments in proximity to the trail. The East of Bombing Range Road

Alternative (Link 1-25) crosses the Well Spring Segment of the Oregon NHT approximately 210 feet east of the Applicant's Proposed Action Alternative. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the communities of Boardman and Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the East of Bombing Range Road Alternative would be those identified as common to all alternatives. If the East of Bombing Range Road Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Applicant's Proposed Action – Southern Route Alternative

Under the Applicant's Proposed Action – Southern Route Alternative, there is the potential for direct and/or indirect effects on 103 previously recorded sites with different sensitivity indexes (high, moderate, or low) (two more sites than the Applicant's Proposed Action Alternative). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 95 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of the West Extension Irrigation Canal and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Applicant's Proposed Action – Southern Route Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 0.9 mile of high cultural resource sensitivity is anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman) identified along this alternative route.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Applicant's Proposed Action – Southern Route Alternative avoids the McKay Creek area. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from the Longhorn

Substation to Pilot Rock and east of Rocky Ridge). Both alternative routes are in proximity to historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman. These significant resources are in the direct effects APE.

The Applicant's Proposed Action – Southern Route Alternative would have the same effects on the Well Spring Segment of the Oregon NHT and trail-associated sites as the Applicant's Proposed Action Alternative, since the two alternative routes share the same alignment where the trail is crossed. The trail is crossed at Link 1-27. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). There would be a potential for visual effects on historic properties associated with Pilot Rock due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action – Southern Route Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Additional Action – 69-Kilovolt Line Replacement

The environmental consequences for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

West of Bombing Range Road – Southern Route Alternative

Under the West of Bombing Range Road – Southern Route Alternative, there is the potential for direct and/or indirect effects on 97 previously recorded sites with different sensitivity indexes (high, moderate, or low) (four fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 89 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of the West Extension Irrigation Canal and the Well Spring Segment of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the West of Bombing Range Road – Southern Route Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 0.9 mile of high cultural resource sensitivity is anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high

sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to sites of tribal concern (two previously recorded historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman) identified along this alternative route.

Key resources, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the West of Bombing Range Road – Southern Route Alternative avoids the McKay Creek area and sites of tribal significance near Pilot Rock. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (south of the Longhorn Substation and east of Rocky Ridge). Both alternative routes are in proximity to historic properties of religious and cultural significance to Indian tribes identified in the NWSTF Boardman. These resources are in the direct effects APE. An additional key resource identified along this alternative route is Birch Creek, an area of Native American concern (refer to Section 3.2.14) in the vicinity of the study corridor.

The West of Bombing Range Road – Southern Route Alternative would have the same effects on the Well Spring Segment of the Oregon NHT and trail-associated sites as the Applicant's Proposed Action Alternative, since the two alternative routes share the same alignment where the trail is crossed. The trail is crossed at Link 1-27. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails. There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). The West of Bombing Range Road – Southern Route Alternative lies considerably farther from historic resources associated with Pilot Rock.

Without mitigation, the type of potential impacts (direct and indirect) of the West of Bombing Range Road – Southern Route Alternative would be those identified as common to all alternatives. If the West of Bombing Range Road – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Additional Action – 69-Kilovolt Line Replacement

The environmental consequences for Design Options 1, 2, and 3 would be the same as discussed for Design Option 1 under the Applicant's Proposed Action Alternative.

Longhorn Alternative

Under the Longhorn Alternative, there is the potential for direct and/or indirect effects on 81 previously recorded sites with different sensitivity indexes (high, moderate, or low) (20 fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 4 have been categorized as high sensitivity, 5

as moderate sensitivity, and 72 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the West Extension Irrigation Canal, and two segments of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Longhorn Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 1.4 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Longhorn Alternative. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along the Longhorn Alternative include the Oregon NHT, trail-associated sites, the Interpretative Park-California Gulch of the Oregon NHT, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. This alternative route crosses the Oregon NHT and the McKay Creek area. The Longhorn Alternative avoids the Well Spring Segment of the Oregon NHT, the Lower Well Springs Diversion of the Well Spring Segment of the Oregon NHT, Sand Hollow Battlefield 1848 (Native American concern), and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes).

An additional key resource identified along the Longhorn Alternative is Butter Creek, an area of Native American concern (refer to Section 3.2.14). This resource is in the vicinity of the study corridor.

Potential impacts on the Oregon NHT and trail-associated sites would be similar to the Applicant's Proposed Action Alternative. The Longhorn Alternative does not cross the NRHP-listed Well Spring Segment of the Oregon NHT, but does cross a previously recorded, contributing segment of the trail to the west of Sand Hollow in Morrow County (Link 1-15). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented pre-contact sites along Link 1-77 (specifically southeast of Kamela).

No visual effects on historic properties associated with Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). The Longhorn Alternative is located considerably farther from historic resources associated with Boardman.

Without mitigation, the type of potential impacts (direct and indirect) of the Longhorn Alternative would be those identified as common to all alternatives. If the Longhorn Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Interstate 84 Alternative and Variations

Under the Interstate 84 Alternative, there is the potential for direct and/or indirect effects on 89 previously recorded sites with different sensitivity indexes (high, moderate, or low) (12 fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 4 have been categorized as high sensitivity, 7 as moderate sensitivity, and 78 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of one historic cairn, the Hunt Ditch, the Courtney Ditch Lateral, and the West Extension Irrigation Canal. One unrecorded segment of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts, under the Interstate 84 Alternative, would be more significant than for the Applicant's Proposed Action Alternative (Table 3-446). A total of 2.8 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.3 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Interstate 84 Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along this alternative route. There is the potential for additional miles of high cultural resource sensitivity in the McKay Creek area (high potential to encounter undocumented, significant sites).

Key resources identified along the Interstate 84 Alternative include the Oregon NHT, trail-associated sites, the Upper Columbia River Route Study Trail, the Umatilla River Route and Columbia River to The Dalles Study Trail, and the Lewis and Clark NHT. Of these resources, only the Oregon NHT (unrecorded segment [unknown condition]) and the Umatilla River Route and Columbia River to The Dalles Study Trail (unrecorded segment) are in the direct effects APE, and also are crossed by the alternative route (refer to maps MV-25 and MV-26 for inventory data).

Additional key resources identified along this alternative route include the Umatilla Army Ordinance Depot and sites of Native American concern (e.g., rock alignments, human burial site [funerary objects], and one culturally modified trees locale). These cultural resources are in the indirect effects APE. Both the Interstate 84 Alternative and the Applicant's Proposed Action Alternative cross the McKay Creek area. Compared to the Applicant's Proposed Action Alternative, the Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 (Native American concern) and the NWSTF Boardman and associated sites (including two historic properties of religious and cultural significance to Indian tribes) (refer to Section 3.2.14).

There is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and south east of Kamela (Link 1-77), along with the potential for significant pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

Cultural resources that potentially would be affected visually by this alternative route include numerous historic resources associated with the community of Echo. No visual effects on historic properties

associated with the communities of Boardman and Pilot Rock are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 Alternative would be those identified as common to all alternatives. If the Interstate 84 Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S1-A1

There is the potential for direct and/or indirect effects on six previously recorded sites with different sensitivity indexes (moderate or low) along Variation S1-A1. Of these sites, one has been categorized as moderate sensitivity and five as low sensitivity (Table 3-446). Although there are no previously recorded sites designated with a high sensitivity index along this route variation, one unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Additional unrecorded segments of the trail are in the direct effects APE. Previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Previously recorded sites identified along this route variation mainly consist of historic transportation corridors (Indian Trails). Most of the previously recorded sites occur in the vicinity of the community of Echo.

In Variation S1-A1, there are 0.0 miles of high, 1.4 miles of moderate, and 1.3 miles of low cultural resource sensitivity. The remaining 15.8 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-446). Miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT along Variation S1-A1.

Key resources identified along Variation S1-A1 include one unrecorded segment (unknown condition) of the Oregon NHT and one site of Native American concern (human burial site [funerary objects]). There is the potential for undocumented, trail-associated sites to occur along this route variation near the Echo area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-A1 would be those identified as common to all alternatives. If Variation S1-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the majority of its length, Variation S1-A1 closely follows the I-84 corridor.

Variation S1-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S1-A1 (Table 3-446). Although Variation S1-A2 and Variation S1-A1 do not share similar alignments, sites are the same because they occur near an area where the route variations intersect (Echo area). Variation S1-A2 is closer to previously recorded sites than Variation S1-A1. Previously

recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S1-A2 would be similar to Variation S1-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-446). These route variations do not cross any known area of high cultural resource sensitivity; however, miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT identified (crossed) along these route variations.

Key resources identified along Variation S1-A2 are the same as those identified along Variation S1-A1. Although these route variations do not share similar alignments, key resources are the same because they occur near an area where the route variations intersect (Echo area).

There is the potential for undocumented, trail-associated sites to occur along this route variation in or near the Echo and Nolin areas.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S1-A2 would be those identified as common to all alternatives. If Variation S1-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S1-A2 is colocated with an existing transmission line.

Interstate 84 – Southern Route Alternative

Under the Interstate 84 – Southern Route Alternative, there is the potential for direct and/or indirect effects on 92 previously recorded sites with different sensitivity indexes (high, moderate, or low) (three more sites than the Interstate 84 Alternative). Of these sites, 3 have been categorized as high sensitivity, 6 as moderate sensitivity, and 83 as low sensitivity (Table 3-446). Previously recorded sites with a high sensitivity index consist of the Hunt Ditch, the Courtney Ditch Lateral, and the West Extension Irrigation Canal. One unrecorded, segment of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4). Because the existing condition of the environment relevant to cultural resources is similar to the Interstate 84 Alternative, these two alternative routes are compared.

Potential impacts under the Interstate 84 – Southern Route Alternative would be similar to the Interstate 84 Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-446). A total of 2.4 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 2.8 miles along the Interstate 84 Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Interstate 84 Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along these alternative routes.

Key resources identified along this alternative route are similar to those identified along the Interstate 84 Alternative, except that the Interstate 84 – Southern Route Alternative avoids the McKay Creek area and sites of tribal significance near Pilot Rock. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared or intersect (from the Longhorn Substation [to the east/southeast] to Pilot Rock).

The Interstate 84 – Southern Route Alternative would have the same effects on the Oregon NHT (unrecorded segment [unknown condition]) and trail-associated sites as the Interstate 84 Alternative, since the two alternative routes share the same alignment where the trail is crossed (refer to map MV-25 for inventory data). The trail is crossed at Link 1-31. Potential impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail (unrecorded segment) would be the same as the Interstate 84 Alternative. Segments of this Study Trail have not been documented in or near the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites (pre-contact and historic) near the Umatilla River crossings (Link 1-31) and south east of Kamela (Link 1-77), along with the potential for significant pre-contact sites south of Pendleton, in the indirect effects APE (Link 1-39).

Cultural resources that potentially would be affected visually by this alternative route are the same as those identified along the Interstate 84 Alternative because these alternative routes share the same alignment, passing in proximity to the same resources. No visual effects on historic properties associated with the community of Boardman are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014). There would be a potential for visual effects on historic properties associated with Pilot Rock due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 – Southern Route Alternative would be those identified as common to all alternatives. If the Interstate 84 – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action – Southern Route Alternative, the East of Bombing Range Road Alternative, and the Applicant's Proposed Action Alternative potentially would affect the highest number of previously recorded sites. The other four alternative routes potentially would affect fewer previously recorded sites. The following alternative routes are listed in order from the highest to the lowest number of sites identified along their study corridors: the West of Bombing Range Road – Southern Route Alternative, the Interstate 84 – Southern Route Alternative, the Interstate 84 Alternative, and the Longhorn Alternative. Overall, the majority of the previously recorded sites are in the indirect effects APE (over 87 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Even though the Interstate 84 – Southern Route Alternative is not the shortest or the one with the lowest number of previously recorded sites that would be potentially affected, this alternative route avoids highly significant resources that are located in proximity to, or, are crossed by the other six alternative routes. These culturally significant resources are two historic properties of religious and cultural significance to Indian tribes (CTUIR) in the NWSTF Boardman, the cultural landscape in the McKay Creek area, and the NRHP-listed Well Spring Segment of the Oregon NHT. Although the Interstate 84 – Southern Route Alternative does cross the Oregon NHT, it crosses an unrecorded segment of the trail, which is of unknown condition (refer to map MV-25 for inventory data). The Interstate 84 – Southern Route Alternative is located farther west and south of the McKay Creek area and undocumented historic transportation corridors.

Despite its distance from the aforementioned culturally significant resources, the Interstate 84 – Southern Route Alternative has the second highest miles of high cultural resource sensitivity, after the Interstate 84 Alternative. Miles of high cultural resource sensitivity are the result of three historic canals crossed. Additional miles of high cultural resource sensitivity would be anticipated along this alternative route due to one unrecorded segment (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data).

In contrast to the Interstate 84 – Southern Route Alternative, the alternative routes with the fewest miles of high cultural resource sensitivity are the Applicant's Proposed Action – Southern Route Alternative and the West of Bombing Range Road – Southern Route Alternative; however, these two are in proximity to the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman (direct and indirect effects APEs) and cross the NRHP-listed Well Spring Segment of the Oregon NHT. These alternative routes also are in proximity to Sand Hollow Battlefield 1848 (Native American concern). Based on Ethnographic data, one area of Native American concern, the Birch Creek, is located in the vicinity of the West of Bombing Range Road – Southern Route Alternative.

Previously recorded sites that potentially would be affected by Variation S1-B1 are similar to those identified along Variation S1-B2, since the majority of the sites occur in areas where the route variations become closer to one another or intersect. Potential impacts under Variation S1-B1 also would be similar to its counterpart, except for minor changes in the total mileage of cultural resource sensitivity. Changes in the mileage of cultural resource sensitivity are based on the proximity of the sites to the route variations. Of the two route variations, only Variation S1-B2 crosses an area of high cultural resource sensitivity. Potential impacts on the Oregon NHT (previously recorded, contributing segment) under Variation S1-B1 would be similar to Variation S1-B2, except that Variation S1-B1 is located farther from the trail, which would result in less intense impacts.

Previously recorded sites that potentially would be affected by Variation S1-A1 are similar to those identified along Variation S1-A2, since the majority of the sites occur in areas where the route variations become closer to one another or intersect (Echo area). Potential impacts under Variation S1-A1 also would be similar to its counterpart, except for minor changes in the total mileage of cultural resource sensitivity. Changes in the mileage of cultural resource sensitivity are based on the proximity of the

sites to the route variations. Although these route variations do not cross any area of high cultural resource sensitivity, miles of high cultural resource sensitivity would be anticipated along Variation S1-A1 and Variation S1-A2 due to unrecorded segments (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). There is the potential for undocumented, trail-associated sites to occur along these route variations in or near the Echo area. Additional sites are expected near the Nolin area, along Variation S1-A2, but not along Variation S1-A1.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties, or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

SEGMENT 2—BLUE MOUNTAINS

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 103 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 5 have been categorized as high sensitivity, 5 as moderate sensitivity, and 93 as low sensitivity (Table 3-447). Previously recorded sites with a high sensitivity index consist of one cairn site of unknown temporal affiliation, one homestead, the Mount Emily Lumber Company Railroad, the Oregon NHT (Whiskey Creek Segment), and one Oregon NHT marker. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by the Applicant's Proposed Action Alternative (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 1.8 miles of high, 11.4 miles of moderate, and 16.5 miles of low cultural resource sensitivity. The remaining 4.1 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-447). Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along this alternative route.

Key resources identified along the Applicant's Proposed Action Alternative include the Mount Emily Lumber Company Railroad, the Hilgard Cemetery, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites, and sites of Native American concern (e.g., cairns, rock alignments, and habitation structures). Of these resources, the Mount Emily Lumber Company Railroad and the Oregon NHT (unrecorded segment) are in the direct effects APE, and also are crossed by this alternative route. One additional resource, cairn of unknown temporal affiliation, is located in the direct effects APE.

There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route include numerous historic resources associated with North Powder. Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). No visual effects on historic properties associated with the community of La Grande (including the La Grande Commercial Historic District) are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-A1

There is the potential for direct and/or indirect effects on 47 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-A1 (Table 3-447). Of these sites, 1 has been categorized as moderate sensitivity and 46 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-A1, there are 0.0 miles of high, 1.8 miles of moderate, and 1 mile of low cultural resource sensitivity (Table 3-447).

Key resources identified along Variation S2-A1 include Hilgard Junction, the Hilgard Cemetery, the Mount Emily Lumber Company, and sites of Native American concern (e.g., rock alignments, habitation structures). These resources are located in the indirect effects APE. Unrecorded, intact segments of the Oregon NHT have been identified in the indirect effect APE for this route variation (refer to map MV-25 for inventory data).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-A1 would be those identified as common to all alternatives. If Variation S2-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S2-A1 (Table 3-447). Although Variation S2-A2 and Variation S2-A1 do not share the same alignment, sites are the same because they occur near an area where the two route variations roughly follow similar alignments. There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Table 3-447. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]												National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites														
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites			Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	33.8	2	7	3	2	11	0	42	27	6	2	1	0	103	1	8	93	5	5	4.1	16.5	11.4	1.8[5]
Variation S2-A1	*2.8*	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*1*	*46*	*1*	*0*	*0.0*	*1.0*	*1.8*	*0.0*
Variation S2-A2	*2.9*	*2*	*6*	*0*	*0*	*4*	*0*	*16*	*17*	*2*	*0*	*0*	*0*	*47*	*0*	*0*	*46*	*1*	*0*	*0.0*	*1.4*	*1.5*	*0.0*
Variation S2-B1	*3.7*	*0*	*0*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*26*	*1*	*2*	*22*	*2*	*2*	*0.0*	*0.0*	*3.3*	*0.4*
Variation S2-B2	*3.8*	*0*	*1*	*0*	*1*	*0*	*0*	*13*	*7*	*4*	*0*	*1*	*0*	*27*	*1*	*1*	*23*	*4*	*0*	*0.0*	*0.0*	*3.8*	*0.0*
Variation S2-C1	*9.3*	*0*	*0*	*2*	*1*	*3*	*0*	*7*	*2*	*4*	*0*	*0*	*0*	*19*	*0*	*0*	*15*	*4*	*0*	*4.1*	*3.3*	*1.9*	*0.0*
Variation S2-C2	*8.8*	*0*	*0*	*2*	*2*	*4*	*0*	*7*	*6*	*4*	*0*	*0*	*0*	*25*	*0*	*1*	*23*	*2*	*0*	*0.2*	*5.7*	*3*	*0.0*
Variation S2-E1	*2.3*	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*6*	*0*	*0*	*4*	*2*	*0*	*0.0*	*2.3*	*0*	*0.0*
Variation S2-E2	*2.6*	*0*	*0*	*2*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*7*	*1*	*1*	*5*	*2*	*0*	*0.0*	*1.5*	*1.1*	*0.0*
Variation S2-F1	*12.1*	*0*	*1*	*2*	*1*	*4*	*0*	*18*	*4*	*0*	*2*	*0*	*0*	*32*	*0*	*2*	*29*	*1*	*2*	*0.0*	*7.7*	*3.4*	*1.0*[5]
Variation S2-F2	*12.2*	*0*	*1*	*2*	*3*	*5*	*0*	*24*	*4*	*2*	*2*	*0*	*0*	*43*	*0*	*0*	*41*	*2*	*0*	*0.0*	*8.7*	*3.5*	*0.0*[5]
Glass Hill	33.7	2	7	3	2	11	0	37	25	5	2	1	0	95	1	8	86	3	6	5.3	17.2	9.1	2.1[5]
Variation S2-D1	*4.3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4.3*	*0.0*	*0*	*0.0*
Variation S2-D2	*4.1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4.1*	*0.0*	*0*	*0.0*
Mill Creek	34.0	2	8	3	5	11	0	51	34	9	2	2	1	128	1	5	114	13	1	0.0	14.6	18.9	0.5[5]

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]The Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

[5]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT along these alternative routes and route variations (refer to map MV-25 for inventory data).

NRHP = National Register of Historic Places

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Potential impacts under Variation S2-A2 would be similar to Variation S2-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). These route variations do not cross any known area of high cultural resource sensitivity.

Key resources identified along this route variation are the same as those identified along Variation S2-A1 because these route variations follow similar alignments, passing in proximity to the same resources. Potential impacts on the Oregon NHT (unrecorded, intact segment) would be similar to Variation S2-A1, except that Variation S2-A2 is located farther from the trail resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There also is the potential for direct effects on undocumented historic transportation corridors along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-A2 would be those identified as common to all alternatives. If Variation S2-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S2-A2 closely parallels an existing transmission line.

Variation S2-B1

There is the potential for direct and/or indirect effects on 26 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S2-B1 (Table 3-447). Of these sites, 2 have been categorized as high sensitivity, 2 as moderate sensitivity, and 22 as low sensitivity. Previously recorded sites with a high sensitivity index consist of the Oregon NHT (Whiskey Creek Segment) and one Oregon NHT-associated marker. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-B1, there are 0.4 mile of high, 3.3 miles of moderate, and 0.0 miles of low cultural resource sensitivity (Table 3-447).

Key resources identified along Variation S2-B1 include one pioneer grave site, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites, and sites of Native American concern (e.g., pre-contact lithic scatters). These resources are located in the indirect effects APE. There is the potential for direct effects on undocumented, mining-related sites along this route variation.

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-B1 would be those identified as common to all alternatives. If Variation S2-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-B2

There is the potential for direct and/or indirect effects on 27 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-B2 (one additional site than Variation S2-B1). Of these sites, 4 have been categorized as moderate sensitivity and 23 as low sensitivity (Table 3-447). There are no previously recorded sites designated with a high sensitivity index along this route variation. Variation S2-B2 is located farther from previously recorded sites designated with a high sensitivity index than Variation S2-B1. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-B2 would be similar to Variation S2-B1 except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). Variation S2-B2 does not cross any known area of high cultural resource sensitivity. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S2-B1.

Key resources identified along Variation S2-B2 include one pioneer grave site, the Oregon NHT, trail-associated sites, and one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) (refer to Section 3.2.14). These resources are in the indirect effects APE. Potential impacts on the Oregon NHT (Whiskey Creek Segment) would be similar to Variation S2-B1, except that Variation S2-B2 is closer to the trail resulting in the potential for more intense impacts. The Oregon NHT is in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-B2 would be those identified as common to all alternatives. If Variation S2-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S2-B2 closely parallels an existing transmission line.

Variation S2-C1

There is the potential for direct and/or indirect effects on 19 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-C1 (Table 3-447). Of these sites, 4 have been categorized as moderate sensitivity and 15 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-C1, there are 0.0 miles of high, 1.9 miles of moderate, and 3.3 miles of low cultural resource sensitivity. The remaining 4.1 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this route variation (Table 3-447).

Key resources identified along Variation S2-C1 include pioneer grave sites, the Oregon NHT (unrecorded segment, intact segment), trail-associated sites, and sites of Native American concern (e.g., pre-contact lithic scatters). These resources are located in the indirect effects APE. There is the potential for direct effects on undocumented, mining-related sites along this route variation.

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-C1 would be those identified as common to all alternatives. If Variation S2-C1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-C2

There is the potential for direct and/or indirect effects on 25 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-C2 (six more sites than Variation S2-C1). Of these sites, 2 have been categorized as moderate sensitivity and 23 as low sensitivity (Table 3-447). There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-C2 would be similar to Variation S2-C1, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-447). These two route variations do not cross any known area of high cultural resource sensitivity.

Key resources identified along this route variation are the same as those identified along Variation S2-C1, except that Variation S2-C2 crosses one site of tribal significance (pre-contact lithic scatter). Key resources are the same because they occur near the areas where the route variations become closer to one another or intersect. Potential impacts on the Oregon NHT (unrecorded, intact segment) and trail-associated sites would be similar to Variation S2-C1, except that Variation S2-C2 is closer to the trail resulting in the potential for more intense impacts (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites in the Ladd Marsh Wildlife Area (east of the route variation), along with the potential for undocumented, mining-related sites south of Morgan Lake.

There would be a potential for visual effects on historic properties associated with La Grande (including the La Grande Commercial Historic District) due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-C2 would be those identified as common to all alternatives. If Variation S2-C2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-E1

There is the potential for direct and/or indirect effects on six previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-E1 (Table 3-447). Of these sites, two have been categorized as moderate sensitivity and four as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-E1, there are 0.0 miles of high, 0.0 miles of moderate, and 2.3 miles of low cultural resource sensitivity (Table 3-447).

A key resource identified along Variation S2-E1 is the Oregon NHT. The historic trail (including unrecorded, intact segments) is in the indirect effects APE (refer to map MV-25 for inventory data). There is an extensive pre-contact lithic procurement area/homestead in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-E1 would be those identified as common to all alternatives. If Variation S2-E1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-E2

There is the potential for direct and/or indirect effects on seven previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-E2 (one additional site than Variation S2-E1). Of these sites, two have been categorized as moderate sensitivity and five as low sensitivity (Table 3-447). There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-E2 would be similar to Variation S2-E1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). These route variations do not cross any known area of high cultural resource sensitivity.

Key resources identified along this route variation are the same as those identified along Variation S2-E1. Although these route variations do not share similar alignments, resources are the same because they occur in the areas where the route variations become closer to one another. Potential impacts on the Oregon NHT would be similar to Variation S2-E1, except that Variation S2-E2 is closer to the trail (previously recorded, contributing segment) resulting in the potential for more intense impacts. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-E2 would be those identified as common to all alternatives. If Variation S2-E2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-F1

There is the potential for direct and/or indirect effects on 32 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S2-F1 (Table 3-447). Of these sites, 2 have been categorized as high sensitivity, 1 as moderate sensitivity, and 29 as low sensitivity. Previously recorded sites with a high sensitivity index consist of one cairn of unknown temporal affiliation and one homestead. One unrecorded segment of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S2-F1, there are 1.0 mile of high, 3.4 miles of moderate, and 7.7 miles of low cultural resource sensitivity (Table 3-447). Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along this route variation.

Key resources identified along Variation S2-F1 include the Oregon NHT (unrecorded segments of unknown condition), one trail-associated site (Clover Creek Station), and sites of Native American concern (e.g., rock features, extensive pre-contact lithic procurement area/homestead). Variation S2-F1 crosses one unrecorded segment of the Oregon NHT. There is the potential for direct effects on undocumented, trail-associated sites along this route variation.

Cultural resources that potentially would be affected visually by this route variation include numerous historic resources associated with North Powder. Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-F1 would be those identified as common to all alternatives. If Variation S2-F1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-F2

There is the potential for direct and/or indirect effects on 43 previously recorded sites with different sensitivity indexes (moderate or low) along Variation S2-F2 (11 more sites than Variation S2-F1). Of these sites, two have been categorized as moderate sensitivity and 41 as low sensitivity (Table 3-447). Although there are no previously recorded sites designated with a high sensitivity index along this route variation, one unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S2-F2 would be similar to Variation S2-F1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-447). Variation S2-F2 does not cross any known area of high cultural resource sensitivity. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S2-F1. Miles of high cultural

resource sensitivity would be anticipated along Variation S2-F2 due to one unrecorded segment of the Oregon NHT identified (crossed) along this route variation.

Key resources identified along Variation S2-F2 are the same as those identified along Variation S2-F1, since these route variations follow similar alignments, passing in proximity to the same resources. Since Variation S2-F2 is colocated with an existing transmission line, potential impacts on the Oregon NHT (unrecorded segment) would be less along this route variation. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, trail-associated sites along this route variation.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S2-F1. Although Variation S2-F2 and Variation S2-F1 do not share the same alignment, most of the resources that potentially would be affected visually occur in proximity to an area where the alignments become closer to one another (eastern portion of the route variation).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S2-F2 would be those identified as common to all alternatives. If Variation S2-F2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the majority of its length, Variation S2-F2 is colocated with an existing transmission line.

Glass Hill Alternative

Under the Glass Hill Alternative, there is the potential for direct and/or indirect effects on 95 previously recorded sites with different sensitivity indexes (high, moderate, or low) (eight fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 6 have been categorized as high sensitivity, 3 as moderate sensitivity, and 86 as low sensitivity (Table 3-447). Previously recorded sites with a high sensitivity index consist of two cairn sites (historic and unknown temporal affiliation), one homestead, the Mount Emily Lumber Company Railroad, the Oregon NHT (Whiskey Creek Segment), and one trail-associated marker. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Glass Hill Alternative would be similar to the Applicant's Proposed Action Alternative, except for minor variations in the total mileages of cultural resource sensitivity (Table 3-447). A total of 2.1 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.8 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Glass Hill Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one

unrecorded segment of the Oregon NHT identified (crossed) along this alternative route. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Key resources identified along the Glass Hill Alternative are the same as those identified along the Applicant's Proposed Action Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located southwest of La Grande). The Glass Hill Alternative and the Applicant's Proposed Action Alternative both cross the Mount Emily Lumber Company Railroad and one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data). Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Glass Hill Alternative is located farther from additional segments of the trail (contributing and unrecorded, intact segments) resulting in the potential for less intense impacts.

There also is the potential for direct effects on undocumented, significant sites in the direct effects APE in the Glass Hill area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are the same as those identified along the Applicant's Proposed Action Alternative because these two alternative routes follow the same alignment, passing in proximity to the same resources. As described for the Applicant's Proposed Action Alternative, visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). No visual effects on historic properties associated with the community of La Grande (including the La Grande Commercial Historic District) are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Glass Hill Alternative would be those identified as common to all alternatives. If the Glass Hill Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S2-D1 and Variation S2-D2

There is no evidence of cultural resource sensitivity along Variation S2-D1 and Variation S2-D2, as no previously recorded sites have been identified along these route variations (Table 3-447).

Mill Creek Alternative

Under the Mill Creek Alternative, there is the potential for direct and/or indirect effects on 128 previously recorded sites with different sensitivity indexes (high, moderate, or low) (25 more sites than the Applicant's Proposed Action Alternative). Of these sites, 1 has been categorized as high sensitivity, 13 as moderate sensitivity, and 114 as low sensitivity (Table 3-447). The previously recorded site with a high sensitivity index is the Mount Emily Lumber Company Railroad. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this alternative route (refer to map MV-25 for

inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Mill Creek Alternative would be less significant than for the Applicant's Proposed Action Alternative (Table 3-447). A total of 0.5 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 1.8 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Even though the Mill Creek Alternative crosses the lowest number of miles of high cultural resource sensitivity, a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) is found along this alternative route, in the indirect effects APE (the physical boundaries for this resource is unknown).

Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along the Mill Creek Alternative. Although potential impacts under the Mill Creek Alternative would be lower than the Applicant's Proposed Action Alternative, a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) is in the indirect effects APE for the Mill Creek Alternative.

Key resources identified along this alternative route include pioneer graves, the Hilgard Cemetery, the Oregon NHT (including the Whiskey Creek Segment), trail-associated sites, the Mount Emily Lumber Company Railroad, one NRHP-listed property (Administrative Building, Eastern Oregon State College [La Grande]), and sites of Native American concern (e.g., cairns, rock alignments, habitations structures, and one historic property of religious and cultural significance to an Indian tribe [traditional fishery/campsite of historic temporal affiliation). Of these resources, the historic transportation corridors are in the direct effects APE. The Mill Creek Alternative and the Applicant's Proposed Action Alternative both cross the Mount Emily Lumber Company Railroad and one unrecorded segment of the Oregon NHT (refer to map MV-25 for inventory data). Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Mill Creek Alternative is closer to the trail (contributing and unrecorded, intact segments). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Limited archaeological surveys have been conducted along the Mill Creek Alternative. Additional surveys could reveal more sites. There is the potential for direct effects on undocumented, significant sites near Morgan Lake and through the Ladd Marsh Wildlife Area (Link 2-63). This alternative route avoids the Glass Hill area.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not follow the same alignment south/southeast of the Craig Mountain, most of the resources associated with the community of North Powder occur near the area where the alignments intersect. Visual effects on historic properties associated with North Powder are expected to be minimal due to the varied

topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). There would be a potential for visual effects on historic properties associated with La Grande due to the proximity of the alternative route in that area. Compared to the Applicant's Proposed Action Alternative, the Mill Creek Alternative is considerably closer to historic resources associated with the community of La Grande (including the La Grande Commercial Historic District).

Without mitigation, the type of potential impacts (direct and indirect) of the Mill Creek Alternative would be those identified as common to all alternatives. If the Mill Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the majority of its length, the Mill Creek Alternative is colocated with an existing transmission line. There is one area (east of Morgan Lake) where the alternative route deviates from the existing transmission line.

Conclusions

Based on areas with existing inventories, the Glass Hill Alternative potentially would affect the lowest number of previously recorded sites, followed by the Applicant's Proposed Action Alternative and the Mill Creek Alternative, respectively. The majority of the previously recorded sites are in the indirect effects APE (over 89 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4). Limited archaeological surveys have been conducted along the Mill Creek Alternative, and additional surveys, primarily near Morgan Lake and through the Ladd Marsh Wildlife Area, could reveal more sites.

Potential impacts on cultural resources would be similar along the three alternative routes, except for moderate variations in the total mileage of cultural resource sensitivity. The Glass Hill Alternative crosses more miles of high cultural resource sensitivity than the Applicant's Proposed Action Alternative and the Mill Creek Alternative, respectively. The potential for affecting a greater number of known, high sensitivity sites is the same for the Glass Hill Alternative and the Applicant's Proposed Action Alternative but lower for the Mill Creek Alternative. Even though the Mill Creek Alternative crosses the lowest number of miles of high cultural resource sensitivity, a historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) is found along this alternative route (indirect effects APE).

Additional miles of high cultural resource sensitivity would be anticipated along the three alternative routes due to one, unrecorded segment (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). All three alternative routes cross the same unrecorded segment of the Oregon NHT and parallel one previously recorded, contributing segment of the trail along their western extent. The Glass Hill Alternative would have the lowest overall impact on the Oregon NHT, as this alternative route is located farthest from the trail.

Compared to the Mill Creek Alternative, the Glass Hill Alternative and the Applicant's Proposed Action Alternative, are located farther from numerous historic resources associated with La Grande (including

one NRHP-listed property [Administrative Building, Eastern Oregon State College, La Grande]) and avoid the historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation). Although the latter is not located along the Applicant's Proposed Action Alternative, this sensitive resource has been identified along one of its route variations (Variation S2-B2), in the indirect effects APE. Both the Glass Hill Alternative and the Applicant's Proposed Action Alternative avoid crossing the Ladd Marsh Wildlife Area. The Mill Creek Alternative crosses the western portion of the Ladd Marsh Wildlife Area.

Previously recorded sites that potentially would be affected by Variation S2-A1 are the same as those identified along Variation S2-A2, since they occur in an area where the two route variations follow similar alignments. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. Variation S2-A1 is located closer to previously recorded sites than Variation S2-A2. Variation S2-A1 is closer to one, unrecorded segment of the Oregon NHT than Variation S2-A2. These route variations do not cross any known area of high cultural resource sensitivity.

Previously recorded sites that potentially would be affected by Variation S2-B1, Variation S2-C1, Variation S2-E1, and Variation S2-F1, are similar to those identified along their counterparts, since the majority of the sites occur in areas where the route variations follow similar alignments or intersect. Potential impacts under these route variations also would be similar to their counterparts, except for minor changes in the total mileage of cultural resource sensitivity. Changes in the mileage of cultural resource sensitivity are based on the proximity of the sites to the route variations. Of all the route variations, only Variation S2-B1 and Variation S2-F1 cross areas of high cultural resource sensitivity. Additional miles of high cultural resource sensitivity would be anticipated along Variation S2-F1 and Variation S2-F2 due to one unrecorded segment (unknown condition) of the Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). With regard to the Oregon NHT, of all the route variations considered under Segment 2, Variation S2-F1 and Variation S2-F2 would have the greatest impacts on the Oregon NHT (unrecorded segment [unknown condition]).

Variations S2-D1 and S2-D2 do not cross any known area of high cultural resource sensitivity. No previously recorded sites have been identified along these route variations.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

SEGMENT 3—BAKER VALLEY

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 72 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these

sites, 7 have been categorized as high sensitivity, 15 as moderate sensitivity, and 50 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, the Goodale's Cutoff Study Trail, and three segments of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 3.6 miles of high, 21.9 miles of moderate, and 27.7 miles of low cultural resource sensitivity. The remaining 2 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-448).

Key resources identified along the Applicant's Proposed Action Alternative include the Lime-Dixie Cemetery, the Oregon NHT (including the Flagstaff Hill, Virtue Flat, and Goal 5 segments), trail-associated sites, the Goodale's Cutoff Study Trail, and sites of Native American concern (e.g., cairns and rock alignments). Of these resources, the Oregon NHT (contributing segments) and the Goodale's Cutoff Study Trail (contributing segment) are in the direct effects APE, and also are crossed by the alternative route. This route crosses the Oregon NHT (previously recorded and unrecorded segments) multiple times (refer to map MV-25 for inventory data). One significant site associated with the Oregon NHT is the historic Slough House Stage Station (Stop); this site is in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, rock features (primarily cairns) in the Durkee area. These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route include numerous resources associated with North Powder, Durkee, Weatherby, the Virtue Flat Mining Area, and Signature Rock. The Virtue Flat Mining Area is crossed by this alternative route (Link 3-28). Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014). No visual effects on historic properties associated with Baker City are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-A1

There is the potential for direct and/or indirect effects on eight previously recorded sites with a low sensitivity index along this route variation (Table 3-448). There are no previously recorded sites designated with a moderate or high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S3-A1, there are 0.0 miles of high, 0.0 miles of moderate, and 10.9 miles of low cultural resource sensitivity. The remaining 1.5 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-448).

Key resources identified along Variation S3-A1 include sites of Native American concern (e.g., pre-contact cairn site, pre-contact lithic scatters) and unrecorded segments of the Oregon NHT (refer to map MV-25 for inventory data). Segments of the trail are located approximately 2.0 miles to the west of the route variation. These resources are in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation include numerous historic resources associated with North Powder. Visual effects on historic properties are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-A1 would be those identified as common to all alternatives. If Variation S3-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S3-A1, since these two route variations follow similar alignments (Table 3-448). There are no previously recorded sites designated with a high sensitivity index along this route variation. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-A2 would be similar to Variation S3-A2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). These route variations do not cross any known area of high cultural resource sensitivity.

Key resources, identified along Variation S3-A2, are the same as those identified along Variation S3-A1 because these two route variations follow similar alignments, passing in proximity to the same resources.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-A1 because these route variations follow similar alignments, passing in proximity to the same resources.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-A2 would be those identified as common to all alternatives. If Variation S3-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-448. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]														National Historic Trails/Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites				Not Eligible Sites				Unevaluated Sites				Contributing Segments of the Oregon National Historic Trail and the Goodale's Cutoff Study Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites			Low	Moderate	High	None	Low	Moderate	High
		Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]												
Applicant's Proposed Action	55.2	2	3	0	0	2	9	0	0	14	34	0	0	8	0	72	2	10	50	15	7	2	27.7	21.9	3.6
Variation S3-A1	*12.4*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*2*	*8*	*0*	*0*	*1.5*	*10.9*	*0.0*	*0.0*
Variation S3-A2	*12.2*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*4*	*1*	*0*	*0*	*0*	*0*	*8*	*0*	*0*	*8*	*0*	*0*	*0.9*	*11.3*	*0.0*	*0.0*
Variation S3-B1	*13.9*	*0*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*20*	*0*	*0*	*3*	*0*	*34*	*2*	*2*	*24*	*8*	*2*	*0.5*	*4.9*	*7.4*	*1.1*[5]
Variation S3-B2	*14.4*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*12*	*0*	*1*	*3*	*0*	*27*	*2*	*1*	*19*	*6*	*2*	*0.2*	*8.2*	*4.9*	*1.1*[5]
Variation S3-B3	*14.7*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*13*	*0*	*1*	*3*	*0*	*28*	*2*	*1*	*20*	*6*	*2*	*0.2*	*8.5*	*4.9*	*1.1*[5]
Variation S3-B4	*14.3*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*10*	*0*	*1*	*3*	*0*	*25*	*2*	*1*	*18*	*6*	*1*	*0.2*	*8.7*	*4.2*	*1.2*[5]
Variation S3-B5	*14.0*	*0*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*6*	*8*	*0*	*1*	*3*	*0*	*23*	*2*	*1*	*16*	*6*	*1*	*0.2*	*8.4*	*4.3*	*1.1*[5]
Variation S3-C1	*21.1*	*2*	*1*	*0*	*0*	*1*	*3*	*0*	*0*	*5*	*13*	*0*	*0*	*5*	*0*	*30*	*1*	*6*	*18*	*7*	*5*	*0.0*	*6.6*	*12.0*	*2.5*
Variation S3-C2	*21.7*	*2*	*2*	*0*	*0*	*1*	*3*	*0*	*0*	*12*	*12*	*0*	*0*	*5*	*0*	*37*	*1*	*5*	*26*	*6*	*5*	*0.0*	*7.5*	*11.7*	*2.5*
Variation S3-C3	*21.1*	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*2*	*24*	*4*	*5*	*1.6*	*6.8*	*10.9*	*1.8*
Variation S3-C4	*21.4*	*2*	*2*	*0*	*0*	*1*	*2*	*0*	*0*	*15*	*8*	*0*	*0*	*3*	*0*	*33*	*1*	*3*	*24*	*4*	*5*	*1.6*	*7.2*	*10.8*	*1.8*
Variation S3-C5	*21.0*	*2*	*2*	*0*	*0*	*1*	*1*	*0*	*0*	*15*	*7*	*1*	*0*	*2*	*0*	*31*	*1*	*2*	*24*	*4*	*3*	*3.8*	*9.7*	*6.6*	*0.9*
Variation S3-C6	*24.7*	*2*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*14*	*6*	*1*	*0*	*2*	*0*	*27*	*1*	*1*	*22*	*3*	*2*	*11.1*	*9.5*	*3.6*	*0.5*
Flagstaff A	55.3	2	3	0	0	2	8	0	0	15	22	0	1	8	0	61	2	9	42	13	6	1.7	31.2	18.8	3.6[5]
Timber Canyon	70.3	27	11	3	1	6	15	0	1	49	92	10	5	5	0	225	2	15	199	14	12	5.9	33.2	23.4	7.8
Flagstaff A – Burnt River Mountain	55.3	2	4	0	0	2	7	0	0	25	17	0	1	6	0	64	2	6	48	10	6	3.3	31.4	17.7	2.9[5]
Flagstaff B	56.0	2	3	0	0	2	8	0	0	15	27	0	1	8	0	66	2	9	46	13	7	1.7	31.3	19.4	3.6[5]
Flagstaff B – Burnt River West	55.7	2	4	0	0	2	6	0	0	25	21	1	1	5	0	67	2	4	52	10	5	4.9	34.8	14	2.0[5]
Flagstaff B – Durkee	59.6	2	3	0	0	2	5	0	0	24	20	1	1	5	0	63	2	4	50	9	4	12.8	34.2	11	1.6[5]

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear sites. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

[5]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of one Study Trail along these alternative routes and route variations (refer to map MV-26 for inventory data).

NRHP = National Register of Historic Places

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It should be noted that for the entirety of its length, Variation S3-A2 is colocated with an existing transmission line.

Variation S3-B1

There is the potential for direct and/or indirect effects on 34 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B1. Of these sites, 2 have been categorized as high sensitivity, 8 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S3-B1, there are 1.1 miles of high, 7.4 miles of moderate, and 4.9 miles of low cultural resource sensitivity. The remaining 0.5 mile resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-448).

Key resources identified along Variation S3-B1 include the Oregon NHT (Virtue Flat and Flagstaff Hill segments), trail-associated sites/components (monuments and landmarks), the Goodale's Cutoff Study Trail (contributing segment), and sites of Native American concern (pre-contact rock alignments and pre-contact lithic scatter). Of these resources, the Virtue Flat Segment of the Oregon NHT (contributing segment) and the Goodale's Cutoff Study Trail (contributing segment) are in the direct effects APE, and also are crossed by the route variation.

An additional key resource identify along this route variation is the historic Slough House Stage Station (Stop); this Oregon NHT-associated site is in the indirect effects APE. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation include Signature Rock and numerous mining-related sites associated with the Virtue Flat Mining Area. The Virtue Flat Mining Area is crossed by this route variation. No visual effects on historic properties associated with Baker City are anticipated due to the surrounding topography, vegetative screening, and layout or street plan (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B1 would be those identified as common to all alternatives. If Variation S3-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-B2

There is the potential for direct and/or indirect effects on 27 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B2 (seven fewer sites than Variation S3-B2). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 19 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock alignment (possible stone wall) and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map

MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B2 would be similar to Variation S3-B1, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.1 miles of high cultural resource sensitivity are anticipated along both route variations. The potential for affecting previously recorded, high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B2.

Key resources identified along Variation S3-B2 are the same as those identified along Variation S3-B1. Although these route variations do not share similar alignments, key resources are the same because they occur near the areas where the route variations become closer to one another or intersect.

Potential impacts on the Oregon NHT would be similar to Variation S3-B1. Although these route variations cross the same trail segment (Virtue Flat Segment), the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail would be similar to Variation S3-B1, except that Variation S3-B2 is located farther from previously recorded segments of the Goodale's Cutoff Study Trail (refer to map MV-26 for inventory data). Variation S2-B2 crosses one unrecorded segment of the Study Trail.

Cultural resources that potentially would be affected visually by this route variation include numerous resources associated with the Virtue Flat Mining Area, Signature Rock, and one unidentified Goal 5 Resource. This route variation does not cross the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B2 would be those identified as common to all alternatives. If Variation S3-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-B2 closely parallels an existing transmission line.

Note: Because the existing condition of the environment relevant to cultural resources for Variations S3-B3, S3-B4, and S3-B5 is similar to Variation S3-B2, these four route variations are compared.

Variation S3-B3

There is the potential for direct and/or indirect effects on 28 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B2 (one additional site than Variation S3-B1). Of these sites, 2 have been categorized as high sensitivity, 6 as moderate sensitivity, and 20 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock alignment (possible stone wall) and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map

MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B3 would be similar to Variation S3-B2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.1 miles of high cultural resource sensitivity are anticipated in both route variations. The potential for affecting known high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B3.

Key resources identified along Variation S3-B3 are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B3 would have the same effects on the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail as Variation S3-B2, since the two route variations share the same alignment where the trails are crossed (refer to maps MV-25 and MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B3 would be those identified as common to all alternatives. If Variation S3-B3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-B3 is colocated with an existing transmission line.

Variation S3-B4

There is the potential for direct and/or indirect effects on 25 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B4 (two fewer sites than Variation S3-B2). Of these sites, 1 has been categorized as high sensitivity, 6 as moderate sensitivity, and 18 as low sensitivity (Table 3-448). The previously recorded site associated with a high sensitivity index is the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B4 would be similar to Variation S3-B2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448).). A total of 1.2 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.1 miles along Variation S1-B2. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher

along Variation S3-B2. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B4.

Key resources identified along Variation S3-B4 are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B4 would have similar effects on the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail (unrecorded segment) as Variation S3-B2, since the two route variations follow similar alignments in proximity to the trails (refer to maps MV-25 and MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B4 would be those identified as common to all alternatives. If Variation S3-B4 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-B5

There is the potential for direct and/or indirect effects on 23 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-B5 (four fewer sites than Variation S3-B2). Of these sites, 1 has been categorized as high sensitivity, 6 as moderate sensitivity, and 16 as low sensitivity (Table 3-448). The previously recorded site associated with a high sensitivity index is the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this route variation (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-B5 would be similar to Variation S3-B2, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.1 miles of high cultural resource sensitivity are anticipated along both route variations. The potential for affecting known high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along Variation S3-B5.

Key resources identified along Variation S3-B5 are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-B5 would have similar effects on the Oregon NHT (Virtue Flat Segment) and the Goodale's Cutoff Study Trail (unrecorded segment) as Variation S3-B2, since the two route variations

follow similar alignments in proximity to the trails (refer to maps MV-25 and MV-26 for inventory data). Although these route variations cross the same trail segments, the exact location they cross varies. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-B2 because these route variations follow similar alignments, passing in proximity to the same resources. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the route variation in that area

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-B5 would be those identified as common to all alternatives. If Variation S3-B5 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C1

There is the potential for direct and/or indirect effects on 30 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C1. Of these sites, 5 have been categorized as high sensitivity, 7 as moderate sensitivity, and 18 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and two previously recorded segments of the Oregon NHT. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zones; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In Variation S3-C1, there are 2.5 miles of high, 12 miles of moderate, and 6.6 miles of low cultural resource sensitivity (Table 3-448).

Key resources identified along Variation S3-C1 include the Lime-Dixie Cemetery, the Oregon NHT (including the Goal 5 Segment), the Rattlesnake Springs Landmark of the Oregon NHT, and sites of Native American concern (e.g., pre-contact cairns). Of these resources, one pre-contact cairn site and the Oregon NHT are in the direct effects APE. Variation S3-C1 crosses the Oregon NHT multiple times (previously recorded and unrecorded segments).

Cultural resources that potentially would be affected visually by this route variation include numerous historic resources associated with Durkee and Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C1 would be those identified as common to all alternatives. If Variation S3-C1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C2

There is the potential for direct and/or indirect effects on 37 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C2 (seven more sites Variation S3-C1). Of these sites, 5 have been categorized as high sensitivity, 6 as moderate sensitivity, and 26 as low

sensitivity (Table 3-448). Sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and two previously recorded segments of the Oregon NHT. Most of the previously recorded sites identified along this route variation are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C2 would be similar to Variation S3-C1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 2.5 miles of high cultural resource sensitivity are anticipated in both route variations. The potential for affecting known high sensitivity sites is the same along both route variations.

Key resources identified along Variation S3-C2 are the same as those identified along Variation S3-C1 because these route variations follow similar alignments, passing in proximity to the same resources.

Variation S3-C2 would have the same effects on the Oregon NHT (previously recorded and unrecorded segments) as Variation S3-C1, since the two route variations share the same alignment where the trail is crossed (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-C1 because these route variations share the same alignment, passing in proximity to the same resources.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C2 would be those identified as common to all alternatives. If Variation S3-C2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-C2 is colocated with an existing transmission line.

Variation S3-C3

There is the potential for direct and/or indirect effects on 33 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C3 (three mores sites than Variation S3-C1). Of these sites, 5 have been categorized as high sensitivity, 4 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, the Burnt River to Boise City Road, the Rattlesnake Springs Landmark of the Oregon NHT, and the Schuck Irrigation Ditch. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C3 would be similar to Variation S3-C1, except for minor to moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.8 miles of high cultural resource sensitivity are anticipated along this route variation compared to 2.5 miles along Variation S3-C1. The potential for affecting known high sensitivity sites is the same along

both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C3.

Key resources identified along this route variation are the same as those identified along Variation S3-C1. Although the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another.

Potential impacts on the Oregon NHT would be similar to Variation S3-C1, except that Variation S3-C3 crosses one unrecorded segment (unknown condition) of the trail and lies farther from previously recorded segments, resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Variation S3-C3 crosses one unrecorded segment (unknown condition) of the Oregon NHT at Link 3-60 and avoids the trail crossing near Durkee. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are similar to those identified along Variation S3-C1. Variation S3-C3 lies farther from historic resources associated with Durkee. Variation S3-C3 and Variation S3-C1 share the same alignment, passing in proximity to Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C3 would be those identified as common to all alternatives. If Variation S3-C3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

There are areas where Variation S3-C3 is colocated with an existing transmission line.

Note: Because the existing condition of the environment relevant to cultural resources for Variations S3-C4, S3-C5, and S3-C6 is similar to Variation S3-C3, these four route variations are compared

Variation S3-C4

There is the potential for direct and/or indirect effects on 33 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C4 (same number of sites as Variation S3-C3). Of these sites, 5 have been categorized as high sensitivity, 4 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, the Burnt River to Boise City Road, Rattlesnake Springs Landmark of the Oregon NHT, and the Schuck Irrigation Ditch. One unrecorded (unknown condition) segment of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C4 would be similar to Variation S3-C3, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.8 miles of high cultural

resource sensitivity are anticipated in both route variations. The potential for affecting known high sensitivity sites is the same along both route variations. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C4.

Key resources identified along this route variation are the same as those identified along Variation S3-C3 because these route variations share the same alignment, passing in proximity to the same resources.

Variation S3-C4 would have the same effects on the Oregon NHT as Variation S3-C3, since the two route variations share the same alignment where the trail is crossed (refer to map MV-25 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S3-C3 because these route variations share the same alignment passing in proximity to the same resources.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C4 would be those identified as common to all alternatives. If Variation S3-C4 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C5

There is the potential for direct and/or indirect effects on 31 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C5 (two fewer sites than Variation S3-C3). Of these sites, 3 have been categorized as high sensitivity, 4 as moderate sensitivity, and 24 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, and the Schuck Irrigation Ditch. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C5 would be similar to Variation S3-C3, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 0.9 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.8 miles along Variation S3-C3. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S3-C3. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C5.

Key resources identified along Variation S3-C5 are the same as those identified along Variation S3-C3. Although the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another.

Potential impacts on the Oregon NHT would be similar to Variation S3-C3, except that Variation S3-C5 is located farther from previously recorded segments the trail, resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Variation S3-C5 crosses one unrecorded segment of the Oregon NHT at Link 3-60 and then deviates from the historic trail for the majority of its length. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are similar to those identified along Variation S3-C3. Variation S3-C5 lies farther from historic resources associated with Durkee and Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C5 would be those identified as common to all alternatives. If Variation S3-C5 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S3-C6

There is the potential for direct and/or indirect effects on 27 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S3-C6 (six fewer sites than Variation S3-C3). Of these sites, 2 have been categorized as high sensitivity, 3 as moderate sensitivity, and 22 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of the Dixie Cellar and the Schuck Irrigation Ditch. One unrecorded segment (unknown condition) of the Oregon NHT is crossed by this route variation (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C6 would be similar to Variation S3-C3, except for significant changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 0.5 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.8 miles along Variation S3-C3. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S3-C3. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of the Oregon NHT identified (crossed) along Variation S3-C6.

Key resources identified along Variation S3-C6 are similar to those identified along Variation S3-C3, except that Variation S3-C6 avoids the Rattlesnake Springs Landmark of the Oregon NHT. Although

the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another.

Potential impacts on the Oregon NHT would be similar to Variation S3-C3, except that Variation S3-C6 is located farther from previously recorded segments the trail, resulting in the potential for less intense impacts (refer to map MV-25 for inventory data). Variation S3-C6 crosses one unrecorded segment of the Oregon NHT at Link 3-60 and then deviates significantly from the historic trail for the majority of its length. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Limited archaeological surveys have been conducted along Variation S3-C6. Additional surveys, particularly along water sources, could reveal more sites. There is the potential for direct effects on unrecorded, significant sites along this route variation (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are similar to those identified along Variation S3-C3. Variation S3-C6 lies farther from historic resources associated with Durkee and Weatherby.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S3-C6 would be those identified as common to all alternatives. If Variation S3-C6 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A Alternative

Under the Flagstaff A Alternative, there is the potential for direct and/or indirect effects on 61 previously recorded sites with different sensitivity indexes (high, moderate, or low) (11 fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 6 have been categorized as high sensitivity, 13 as moderate sensitivity, and 42 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and three previously recorded segments of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff A Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-448). A total of 3.6 miles of high cultural resource sensitivity are anticipated in both alternative routes. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff A Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff A Alternative avoids the historic Slough House Stage Station (Stop). Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another North Powder Valley and east/southeast of Lone Pine Mountain).

Potential impacts on the Oregon NHT (contributing segments) would be similar to the Applicant's Proposed Action Alternative. Although the northern portion of the alternative routes cross the same trail segment (Virtue Flat Segment), the exact location they cross varies. Both the Flagstaff A Alternative and the Applicant's Proposed Action Alternative cross the Oregon NHT multiple times (previously recorded and unrecorded segments [refer to map MV-25 for inventory data]). Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative, since these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff A Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A Alternative would be those identified as common to all alternatives. If the Flagstaff A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed

Timber Canyon Alternative

Under the Timber Canyon Alternative, there is the potential for direct and/or indirect effects on 225 previously recorded sites with different sensitivity indexes (high, moderate, or low) (153 more sites than the Applicant's Proposed Action Alternative). Of these sites, 12 have been categorized as high sensitivity, 14 as moderate sensitivity, and 199 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock image site, one pre-contact rockshelter, the Dixie Cellar, one dam, the Sparta Ditch Lateral, the Waterbury Ditch, the Dry Gulch Ditch, the Burnt River to Boise City Road, two segments of the Goodale's Cutoff Study Trail, and two segments of the Oregon NHT. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

Potential impacts under the Timber Canyon Alternative would be more significant than for the Applicant's Proposed Action Alternative (Table 3-448). A total of 7.8 miles of high cultural resource

sensitivity are anticipated along this alternative route compared to 3.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Timber Canyon Alternative.

Key resources identified along the Timber Canyon Alternative include the Lime-Dixie Cemetery, the Oregon NHT (including Goal 5 segments), the Rattlesnake Springs Landmark of the Oregon NHT, the Goodale's Cutoff Study Trail, and sites of Native American concern (e.g., cairns, rock alignments, rockshelters, and one possible medicine wheel). Of these sites, the Oregon NHT (contributing segments) and the Goodale's Cutoff Study Trail (contributing segments) are in the direct effects APE. This alternative route crosses the Oregon NHT multiple times (previously recorded and unrecorded segments [refer to maps MV-25 and MV-26 for inventory data]). The Timber Canyon Alternative crosses previously recorded, contributing segments of the Goodale's Cutoff Study Trail (main trail alignment and a 0.8-mile-long spur) twice.

An additional key resource identified along this alternative route is the Medical Hot Springs, a culturally sensitive area of Native American concern (refer to Section 3.2.14). This resource is in the indirect effects APE.

Cultural resources that potentially would be affected visually by this alternative route include numerous historic resources associated with Sparta, Weatherby, and North Powder. Visual effects on historic properties associated with the community of North Powder are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Timber Canyon Alternative would be those identified as common to all alternatives. If the Timber Canyon Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A – Burnt River Mountain Alternative

Under the Flagstaff A – Burnt River Mountain Alternative, there is the potential for direct and/or indirect effects on 64 previously recorded sites with different sensitivity indexes (high, moderate, or low) (eight fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 6 have been categorized as high sensitivity, 10 as moderate sensitivity, and 48 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, the Dixie Cellar, the Burnt River to Boise Dixie Road, the Schuck Irrigation Ditch, the Virtue Flat Segment of the Oregon NHT, and the Rattlesnake Springs Landmark of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff A – Burnt River Mountain Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 2.9 miles of high cultural resource sensitivity are

anticipated along this alternative route compared to 3.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff A – Burnt River Mountain Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River Mountain Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River Mountain Alternative avoids multiple crossings of the historic trail (previously recorded segments) near Durkee, resulting in the potential for less intense impacts. Although the alternative routes cross the Virtue Flat Segment of the Oregon NHT (east of Baker City), the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River Mountain Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff A – Burnt River Mountain Alternative is located in the vicinity of one undetermined Goal 5 Resource. In addition, this alternative route lies farther from historic resources associated with Durkee and the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A – Burnt River Mountain Alternative would be those identified as common to all alternatives. If the Flagstaff A – Burnt River Mountain Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B Alternative

Under the Flagstaff B Alternative, there is the potential for direct and/or indirect effects on 66 previously recorded sites with different sensitivity indexes (high, moderate, or low) (six fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 7 have been categorized as high sensitivity, 13

as moderate sensitivity, and 46 as low sensitivity (Table 3-448). Previously recorded sites with a high sensitivity index consist of one pre-contact rock alignment, one homestead, the Dixie Cellar, the Burnt River to Boise City Road, and three segments of the Oregon NHT (including the Virtue Flat). One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff B Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 3.6 miles of high cultural resource sensitivity are anticipated in both alternative routes. The potential for affecting known high sensitivity sites is the same along both alternative routes. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff B Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff B Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT (contributing segments) would be similar to the Applicant's Proposed Action Alternative. Although the northern portion of the alternative routes cross the same trail segment (Virtue Flat Segment), the exact location they cross varies. Both the Flagstaff B Alternative and the Applicant's Proposed Action Alternative cross the Oregon NHT multiple times (previously recorded and unrecorded segments [refer to map MV-25 for inventory data]). Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff B Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Limited archaeological surveys have been conducted along the Flagstaff B Alternative. Additional surveys, particularly along water sources, could reveal more sites.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff B Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B Alternative would be those identified as common to all alternatives. If the Flagstaff B Alternative is selected, the same

Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Burnt River West Alternative

Under the Flagstaff B – Burnt River West Alternative, there is the potential for direct and/or indirect effects on 67 previously recorded sites with different sensitivity indexes (high, moderate, or low) (five fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 5 have been categorized as high sensitivity, 10 as moderate sensitivity, and 52 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of two pre-contact cairns/rock alignments, the Dixie Cellar, the Schuck Irrigation Ditch, and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff B – Burnt River West Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 2.0 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 3.9 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff B – Burnt River West Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff B – Burnt River West Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River West Alternative avoids multiple crossings of the historic trail (previously recorded segments) near Durkee, resulting in the potential for less intense impacts. Although the alternative routes cross the Virtue Flat Segment of the Oregon NHT (east of Baker City), the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff B – Burnt River West Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on unrecorded, significant sites along the southern portion of the alternative route (Burnt River Canyon area). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources. The Flagstaff B – Burnt River West Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Burnt River West Alternative would be those identified as common to all alternatives. If the Flagstaff B – Burnt River West Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Durkee Alternative

Under the Flagstaff B – Durkee Alternative, there is the potential for direct and/or indirect effects on 63 previously recorded sites with different sensitivity indexes (high, moderate, or low) (nine fewer sites than the Applicant's Proposed Action Alternative). Of these sites, 4 have been categorized as high sensitivity, 9 as moderate sensitivity, and 50 as low sensitivity (Table 3-448). Sites with a high sensitivity index consist of one pre-contact rock alignment, the Dixie Cellar, the Schuck Irrigation Ditch, and the Virtue Flat Segment of the Oregon NHT. One unrecorded segment of the Goodale's Cutoff Study Trail is crossed by this alternative route (refer to map MV-26 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Flagstaff B – Durkee Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-448). A total of 1.6 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 3.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to one unrecorded segment of Goodale's Cutoff Study Trail identified (crossed) along the Flagstaff B – Durkee Alternative.

Key resources identified along this alternative route are the same as those identified along the Applicant's Proposed Action Alternative, except that the Flagstaff B – Durkee Alternative avoids the historic Slough House Stage Station (Stop). Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared, or are in proximity to one another.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff A – Burnt River West Alternative avoids multiple crossings of the historic trail (previously recorded segments) near Durkee, resulting in the potential for less intense impacts. Although the alternative routes cross the Virtue Flat Segment of the Oregon NHT (east of Baker City),

the exact location they cross varies. Potential impacts on the Goodale's Cutoff Study Trail (unrecorded segment) would be similar to the Applicant's Proposed Action Alternative, except that the Flagstaff B – Durkee Alternative lies farther from previously recorded segments of the Study Trail, resulting in the potential for less intense impacts (refer to map MV-26 for inventory data). Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There is the potential for direct effects on undocumented, significant sites along the southern portion of this alternative route (south of Alder Creek and west of the Durkee Valley). These resources are of interest to Native American tribes (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes follow similar alignments passing in proximity to the same resources (except for the alternative route's southern extent). The Flagstaff B – Durkee Alternative is located in the vicinity of one undetermined Goal 5 Resource and lies farther from historic resources associated with Durkee, Weatherby, and the Virtue Flat Mining Area. There would be a potential for visual effects on historic properties associated with Baker City due to the proximity of the alternative route in that area.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Durkee Alternative would be those identified as common to all alternatives. If the Flagstaff B – Durkee Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Timber Canyon Alternative potentially would affect the highest number of previously recorded sites, as well as culturally sensitive sites. The other six alternative routes (Applicant's Proposed Action Alternative, Flagstaff A Alternative, Flagstaff A – Burnt River Mountain Alternative, Flagstaff B Alternative, Flagstaff B – Burnt River West Alternative, and Flagstaff B – Durkee Alternative) analyzed in Segment 3 potentially would affect fewer previously recorded sites. These alternative routes are shorter in length and have similar numbers of previously recorded sites. The alternative route with the least number of previously recorded sites is the Flagstaff A Alternative, closely followed by the Flagstaff B – Durkee Alternative and the Flagstaff A – Burnt River Mountain Alternative. The other three alternative routes have slightly more sites than the three aforementioned. Overall, the majority of the previously recorded sites are in the indirect effects APE (over 85 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Overall, these alternative routes are similar in their length and site type. What primarily distinguishes them from one another is their proximity to the Oregon NHT and to cultural resources of Native American concern (e.g., pre-contact medicine wheel, unrecorded rock features along the Burnt River Canyon and the Durkee areas). Regarding the Oregon NHT, most of these alternative routes cross the trail multiple times (unrecorded and unrecorded segments), while two, Flagstaff B – Durkee Alternative

and the Flagstaff B – Burnt River West Alternative, cross the trail fewer times. These two alternative routes would have the lowest impact on the Oregon NHT.

Potential impacts under the Flagstaff B – Durkee Alternative would be significantly lower than the other alternative routes, followed by the Flagstaff B – Burnt River West Alternative. Moderate variations in the total mileage of cultural resource sensitivity are evident along these two alternative routes. The potential for affecting a greater number of previously recorded and high sensitivity sites also is lower along these alternative routes (primarily along the Flagstaff B – Durkee Alternative). Additional miles of high cultural resource sensitivity would be anticipated along these alternative routes due to one, unrecorded segment (unknown condition) of the Goodale's Cutoff Study Trail in the direct effects APE (refer to map MV-26 for inventory data). All of the alternative routes, except for the Applicant's Proposed Action Alternative and the Timber Canyon Alternative, cross one unrecorded segment of the Study Trail.

The Flagstaff B – Durkee Alternative and the Flagstaff B – Burnt River West Alternative lie farther from numerous historic resources associated with the Virtue Flat Mining Area, Goal 5 Resources, and established communities. These two alternative routes avoid numerous pre-contact sites (e.g., rock features, rockshelters, lithic procurement areas) and one culturally sensitive area of Native American concern (Medical Hot Springs).

Previously recorded sites that potentially would be affected by Variation S3-A1 and Variation S3-A2 are the same because these route variations follow similar alignments. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. These route variations do not cross any known area of high cultural resource sensitivity. Variation S3-A2 is colocated with an existing transmission line.

Of the five route variations analyzed in Area B, Variation S3-B5 potentially would affect the fewest number of previously recorded sites, closely followed by the other route variations. Variation S3-B1 potentially would affect the highest number of previously recorded sites. Miles of cultural resource sensitivity would be slightly different based on the proximity of the sites to the route variations. Overall, the majority of previously recorded sites, are in the indirect effects APE (over 94 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Minor variations in the total mileage of cultural resource sensitivity are evident along four of the five route variations, with the exception being Variation S3-B1, which exhibits more significant differences. Differences are the result of Variation S3-B1 crossing one previously recorded, contributing segment of the Goodale's Cutoff Study Trail and the Virtue Flat Mining Area. Regarding the Study Trail, Variation S3-B1 would have the greatest impact on the trail, whereas, the other four route variations cross an unrecorded segment of the Study Trail, and, as a result, will have less impact on the trail (refer to map MV-26 for inventory data). Unlike Variation S3-B1, these four route variations are in proximity to Goal 5 resources. Potential impacts on the Oregon NHT would be similar along the five route variations that have been analyzed. Although these route variations cross the same segment of the trail (Virtue Flat Segment), the exact location where they cross varies. Overall, potential impacts on cultural resources

would be similar along Variations S3-B2, S3-B3, S3-B4, S3-B5 as these route variations follow similar alignments, and are in proximity to the same previously recorded sites and culturally significant areas. Of these, Variation S3-B5 is the one associated with the least number of previously recorded sites.

Of the six route variations analyzed in Area C, Variation S3-C6 potentially would affect the fewest number of previously recorded sites, closely followed by the other route variations. Variation S3-C2 potentially would affect the highest number of previously recorded sites. Miles of cultural resource sensitivity would be different based on the proximity of the sites to the route variations. Overall, the majority of previously recorded sites, are in the indirect effects APE (over 80 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Potential impacts under Variation S3-C6 would be significantly lower than the other route variations, followed by Variation S3-C5. Minor to moderate variations in the total mileage of cultural resource sensitivity are evident along these two route variations. The potential for affecting a greater number of previously recorded and high sensitivity sites also is lower along these route variations (primarily along Variation S3-C6). What primarily distinguishes these two route variations from the other four is their distance from the Oregon NHT. Most of these route variations cross the trail multiple times (unrecorded and unrecorded segments), while Variation S3-C5 and Variation S3-C6 cross the trail fewer times. These two route variations would have the lowest impact on the Oregon NHT. Variation S3-C6 is farther from previously recorded segments of the Oregon NHT than Variation S3-C5.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties, or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

SEGMENT 4—BROGAN

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 81 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 1 has been categorized as high sensitivity, 14 as moderate sensitivity, and 66 as low sensitivity (Table 3-449). The previously recorded site with a high sensitivity index is the Dixie Cellar. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 0.1 mile of high, 6.3 miles of moderate, and 24.5 miles of low cultural resource sensitivity. The remaining 9.2 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-449).

Key resources identified along the Applicant's Proposed Action Alternative include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Old Cemetery, the Lime-Dixie Cemetery, the Oregon NHT (including the Goal 5 Segment), trail-associated landmarks, and sites of Native American concern (e.g., cairns and rock alignments). These resources are in the indirect effects APE.

Cultural resources that potentially would be affected visually by this alternative route include one unidentified Goal 5 Resource, one Goal 5 Resource (Emigrant Graves), and numerous historic resources associated with the Huntington Survey District. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S4-A1

There is the potential for direct and/or indirect effects on 16 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S4-A1 (Table 3-449). Of these sites, 1 has been categorized as high sensitivity, 6 as moderate sensitivity, and 9 as low sensitivity. The previously recorded site associated with a high sensitivity index is the Dixie Cellar. Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S4-A1, there are 0.1 mile of high, 2.8 miles of moderate, and 0.6 mile of low cultural resource sensitivity. The remaining 2.4 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-449).

Key resources identified along Variation S4-A1 include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Cemetery, the Lime-Dixie Cemetery, and the Oregon NHT (including Goal 5 Segment). These cultural resources are in the indirect effects APE. There are sites of Native American concern (e.g., cairns) in the indirect effects APE (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation include one unidentified Goal 5 Resource, one Goal 5 Resource (Emigrant Graves), and numerous historic resources associated with the Huntington Survey District. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S4-A1 would be those identified as common to all alternatives. If Variation S4-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-449. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 4—Brogan

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]														Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites														
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites	National Historic Trails/Study Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	40.1	3	0	1	9	0	0	42	17	5	2	1	1	81	1	10	66	14	1	9.2	24.5	6.3	0.1
Variation S4-A1	*5.9*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*	*9*	*6*	*1*	*2.4*	*0.6*	*2.8*	*0.1*
Variation S4-A2	*6.0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*	*9*	*6*	*1*	*2.3*	*0.5*	*3.1*	*0.1*
Variation S4-A3	*6.1*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*10*	*1*	*0*	*1*	*1*	*16*	*1*	*0*	*10*	*6*	*0*	*2.3*	*0.5*	*3.3*	*0.0*
Tub Mountain South	40.5	12	3	0	8	0	4	56	24	5	5	4	1	122	2	9	94	23	5	6.4	14	18.7	1.4[5]
Willow Creek	34.6	1	1	1	7	1	0	51	20	5	4	1	1	93	1	5	77	13	3	4.1	19.7	10.2	0.6

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

[5]Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT along this alternative route (refer to map MV-25 for inventory data).

NRHP = National Register of Historic Places

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It should be noted that for the majority of its length, Variation S4-A1 closely parallels an existing transmission line.

Variation S4-A2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S4-A1, since these two route variations follow similar alignments (Table 3-449). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S4-A2 would be similar to Variation S4-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-449). A total of 0.1 mile of high cultural resource sensitivity is anticipated in both route variations. These route variations have the potential for affecting the same previously recorded, high sensitivity site.

Key resources identified along Variation S4-A2 are the same as those identified along Variation S4-A1 because these two route variations follow similar alignments, passing in proximity to the same resources. There are sites of Native American concern (e.g., cairns) in the indirect effects APE (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S4-A1 because these route variations follow similar alignments, passing in proximity to the same resources. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of Variation S4-A2 would be those identified as common to all alternatives. If Variation S4-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Compared to Variation S4-A1, Variation S4-A2 would lie farther away from an existing transmission line.

Variation S4-A3

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S4-A1, since these two route variations follow similar alignments (Table 3-449). Of these sites, 6 have been categorized as moderate sensitivity and 10 as low sensitivity. There are no previously recorded sites designated with a high sensitivity index along this route variation (the Dixie Cellar is located farther from this route variation). Most of the previously recorded sites identified along this route variation are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S4-A3 would be similar to Variation S4-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-449). Variation S4-A3 does not cross any

known area of high cultural sensitivity. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the other two route variations.

Key resources identified along Variation S4-A3 are the same as those identified along Variation S4-A1 because these two route variations follow similar alignments, passing in proximity to the same resources. There are sites of Native American concern (e.g., cairns) in the indirect effects APE (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S4-A1 because these route variations follow similar alignments, passing in proximity to the same resources. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014)

Without mitigation, the type of potential impacts (direct and indirect) of Variation S4-A3 would be those identified as common to all alternatives. If Variation S4-A3 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S4-A3 closely parallels an existing transmission line.

Tub Mountain South Alternative

Under the Tub Mountain South Alternative, there is the potential for direct and/or indirect effects on 122 previously recorded sites with different sensitivity indexes (high, moderate, or low) (41 more sites than the Applicant's Proposed Action Alternative). Of these sites, 5 have been categorized as high sensitivity, 23 as moderate sensitivity, and 94 as low sensitivity (Table 3-449). Previously recorded sites with a high sensitivity index consist of two pre-contact cairns/rock alignments, one pre-contact campsite, the Vale Oregon Main Ditch, and the Dixie Cellar. Five unrecorded, intact segments of the Oregon NHT are crossed by this alternative route (refer to map MV-25 for inventory data). Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Tub Mountain South Alternative would be more significant than for the Applicant's Proposed Action Alternative. There are moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-449). A total of 1.4 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 0.1 mile along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Tub Mountain South Alternative. Additional miles of high cultural resource sensitivity would be anticipated due to unrecorded segments of the Oregon NHT identified (crossed) along the Tub Mountain South Alternative. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

Key resources identified along the Tub Mountain South Alternative include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Old Cemetery, the Lime-Dixie Cemetery, the Olds Ferry Railroad Station, the Olds Ferry Road Study Trail, the Oregon NHT (including the Goal 5 Segment), trail-associated sites, the Sand Dunes site, and sites of Native American concern (e.g., human burial sites, cairns, rock alignments, rockshelter). These resources are in the indirect effects APE. Potential impacts on the Oregon NHT and trail-associated sites, under this alternative route would be more significant than for the Applicant' Proposed Action Alternative and the Willow Creek Alternative. As previously mentioned, five unrecorded, intact segments of the Oregon NHT are crossed by this alternative route (refer to map MV-25 for inventory data).

An additional key resource identified along the Tub Mountain South Alternative is Farewell Bend, an area of Native American concern (refer to Section 3.2.14). This significant area is in the indirect effects APE. There is the potential to encounter undocumented, significant pre-contact and historic sites near this area.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative. Although these alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (from Dixie Creek to Durbin Creek, northwest of Huntington) or intersect (near Bully Creek). Of the three alternative routes considered for Segment 4, the Tub Mountain South Alternative is the closest to the Huntington Survey District. Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Tub Mountain South Alternative would be those identified as common to all alternatives. If the Tub Mountain South Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Willow Creek Alternative

Under the Willow Creek Alternative, there is the potential for direct and/or indirect effects on 93 previously recorded sites with different sensitivity indexes (high, moderate, or low) (12 more sites than the Applicant's Proposed Action Alternative). Of these sites, 3 have been categorized as high sensitivity, 13 as moderate sensitivity, and 77 as low sensitivity (Table 3-449). Previously recorded sites with a high sensitivity index consist of one pre-contact cairn, one historic cairn, and the Dixie Cellar. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under the Willow Creek Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-449). A total of 0.6 mile of high cultural resource sensitivity is anticipated along this alternative route compared to 0.1 miles along the Applicant's Proposed Action Alternative. The potential

for affecting a greater number of previously recorded, high sensitivity sites is higher along the Willow Creek Alternative.

Key resources identified along the Willow Creek Alternative include one NRHP-listed property (Oregon Commercial Company Building [Huntington]), the Huntington Cemetery, the Lime-Dixie Cemetery, the Dell Cemetery, the Dalles-Boise Military Road, the Oregon NHT (including Goal 5 Segment), Oregon NHT-associated landmarks, and sites of Native American concern (e.g., rock images, cairns, and rock alignments). Of these resources, only one pre-contact cairn site is in the direct effects APE.

Potential impacts on the Oregon NHT would be similar to the Applicant's Proposed Action Alternative, except that the Willow Creek Alternative is located closer to the trail (south of Dixie Creek) resulting in the potential for less intense impacts. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

An additional key resource identified along the Willow Creek Alternative is the Striped Mountain area, a geographic feature of Native American concern (refer to Section 3.2.14). This area is in the vicinity of the study corridor.

Cultural resources that potentially would be affected visually by this alternative route are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not follow similar alignments, most of the resources occur in areas where the alignments are shared (northwest of Huntington and southwest of Hope Flat). Visual effects on historic properties associated with the Huntington Survey District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Willow Creek Alternative would be those identified as common to all alternatives. If the Willow Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect the lowest number of previously recorded sites, followed by the Willow Creek Alternative. The Tub Mountain South Alternative potentially would affect the highest number of previously recorded sites. The majority of the previously recorded sites are in the indirect effects APE (over 87 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Potential impacts on cultural resources would be different along the three alternative routes in Segment 4. There are moderate to high variations in the total mileage of cultural resource sensitivity. The Tub Mountain South Alternative crosses more miles of high cultural resource sensitivity than the Willow Creek Alternative and the Applicant's Proposed Action Alternative, respectively. The potential for affecting a greater number of known, high sensitivity sites is also higher along the Tub Mountain South Alternative. Additional miles of high cultural resource sensitivity would be anticipated along the Tub Mountain South Alternative due to several previously recorded and unrecorded segments of the

Oregon NHT in the direct effects APE (refer to map MV-25 for inventory data). The Tub Mountain South Alternative crosses the Oregon NHT (five unrecorded, intact segments) multiple times. The Applicant's Proposed Action Alternative and the Willow Creek Alternative would have the lowest overall impact on the Oregon NHT because these alternative routes are located farther from the trail (the Applicant's Proposed Action Alternative being the farthest).

One area of Native American concern (Striped Mountain) has been identified along the Willow Creek Alternative, in the indirect effects APE. The other two alternative routes avoid this sensitive area. Compared to the Tub Mountain South Alternative, both the Applicant's Proposed Action Alternative and the Willow Creek Alternative avoid the Olds Ferry Road Study Trail, human burial sites of tribal significance, and the Farewell Bend. In addition, these two alternative routes avoid one broad cultural landscape that includes important pre-contact and historic cultural resources that extends from the Farewell Bend area to the south. There is the potential for indirect effects on unrecorded, significant sites near the Tub Mountain, the Snake River, Huntington, and the Tom Creek Area, along the Tub Mountain South Alternative.

Previously recorded sites that potentially would be affected by the three route variations in Segment 4 are the same because these route variations follow similar alignments. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. Variation S4-A1 crosses more miles of high cultural resource sensitivity than Variation S4-A2 and Variation S4-A3, respectively. The potential for affecting previously recorded, high sensitivity sites is the same along Variation S4-A1 and Variation S4-A2. Variation S4-A3 does not cross any known area of high cultural resource sensitivity.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

SEGMENT 5—MALHEUR AREA

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 59 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 8 have been categorized as high sensitivity, 10 as moderate sensitivity, and 41 as low sensitivity (Table 3-450). Previously recorded sites with a high sensitivity index consist of one pre-contact lithic scatters, one pre-contact campsite, the Meek Cutoff Study Trail, the Vines Ditch, the South Canal, the Vale Canal, the Kingman Canal, and the North Canal. The historic linear sites are crossed by this alternative route. Most of the previously recorded sites identified along this alternative route are located in the 0–250 feet and the 1,000 feet–2 miles distance zones (primarily in the 1,000 feet–2 miles distance zone [refer to Section 3.2.13.4]).

In the Applicant's Proposed Action Alternative, there are 4.6 miles of high, 9.4 miles of moderate, and 20.5 miles of low cultural resource sensitivity. The remaining 5.9 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along some portions of this alternative route (Table 3-450).

A key resource identified along the Applicant's Proposed Action Alternative is the Meek Cutoff Study Trail. One noncontributing segment of the trail is in the direct effects APE, and also is crossed by the alternative route (refer to map MV-26 for inventory data). The Oregon NHT is located outside of the study corridor. There are sites of Native American concern (e.g., pre-contact cairn) along this alternative route; these resources are in the indirect effects APE.

There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Malheur and Owyhee river crossings.

Cultural resources that potentially would be affected visually by this route include numerous waterworks associated with the Owyhee Dam Historic District. Of the alternative routes considered for Segment 5, the Applicant's Proposed Action Alternative lies farther from the historic district. Visual effects on historic properties associated with the Owyhee Dam Historic District are expected to be minimal due to the varied topography, vegetative screening, and existing infrastructure (Tetra Tech 2014).

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The southern extent of the Applicant's Proposed Action Alternative falls in a designated utility corridor (RMP Utility Corridor).

Variation S5-A1

There is the potential for indirect effects on two previously recorded sites with a low sensitivity index along this route variation (Table 3-450). There are no previously recorded sites designated with a high or a moderate sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S5-A1, there are 0.0 miles of high, 0.0 miles of moderate, and 2.8 miles of low cultural resource sensitivity. The remaining 4.6 miles resulted in no cultural resource sensitivity as no previously recorded sites have been identified along portions of this route variation (Table 3-450). There are no known key resources identified along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-A1 would be those identified as common to all alternatives. If Variation S5-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-450. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 5—Malheur

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]												National Historic Trails/Study Trails[3]	Total Number of Sites in the Direct Effects Area of Potential Effects	Sensitivity Index			Sensitivity (miles crossed)			
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites			Contributing Segments of the Oregon National Historic Trail[2]	NRHP-listed Properties	Total Number of Previously Recorded Sites			Low	Moderate	High	None	Low	Moderate	High
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component												
Applicant's Proposed Action	40.4	2	6	0	1	3	0	32	13	2	0	0	59	1	22	41	10	8	5.9	20.5	9.4	4.6
Variation S5-A1	*7.4*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*2*	*0*	*0*	*4.6*	*2.8*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0*	*1*	*0*	*0*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*4*	*0*	*0*	*4*	*0*	*0*	*1.6*	*5.8*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*4*	*3*	*2*	*2*	*0.0*	*0.4*	*1.0*	*1.1*
Variation S5-B2	*2.8*	*0*	*1*	*0*	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*7*	*0*	*3*	*4*	*1*	*2*	*0.0*	*1.1*	*0.7*	*1.0*
Malheur S	43.5	1	8	2	1	4	0	67	13	4	0	0	100	1	16	89	6	5	1.3	32.1	7.1	3.0
Malheur A	43.1	1	7	2	1	4	0	59	13	4	0	0	91	1	16	79	8	4	1.3	32.3	7.8	1.7

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively. Cultural resources with no spatial data (e.g., historic properties of religious and cultural significance to Indian tribes and unrecorded segment of National Historic Trails or Study Trails) are not included in the quantitative analysis. These resources are discussed qualitatively.

[2]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[3]National Historic Trails and Study Trails are included in the site counts, but are reiterated due to their historical significance.

NRHP = National Register of Historic Places

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Variation S5-A2

There is the potential for indirect effects on four previously recorded sites with a low sensitivity index along this route variation (two mores sites than Variation S5-A1) (Table 3-450). There are no previously recorded sites designated with a high or moderate sensitivity index along this route variation. Previously recorded sites identified along this route variation are located in 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S5-A2 would be similar to Variation S5-A1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-450). These route variations do not cross any known area of high cultural resource sensitivity. In addition, there are no known key resources identified along these route variations.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-A2 would be those identified as common to all alternatives. If Variation S5-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Variation S5-B1

There is the potential for direct and/or indirect effects on seven previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S5-B1. Of these sites, 2 have been categorized as high sensitivity, 2 as moderate sensitivity, and 3 as low sensitivity (Table 3-450). Sites with a high sensitivity index consist of the Kingman Lateral and the North Canal. These historic linear sites are crossed by the route variation. Previously recorded sites identified along this route variation are located in all distance zones (refer to Section 3.2.13.4).

In Variation S5-B1, there are 1.1 miles of high, 1.0 mile of moderate, and 0.4 mile of low cultural resource sensitivity (Table 3-450). There are no known key resources identified along Variation S5-B1.

There is the potential for direct effects on undocumented, archaeological sites along this route variation, primarily along the Owyhee River crossing.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-B1 would be those identified as common to all alternatives. If Variation S5-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Portions of this route variation fall in a designated utility corridor (RMP Utility Corridor).

Variation S5-B2

There is the potential for direct and/or indirect effects on the same previously recorded sites as Variation S5-B1 (Table 3-450). Although the route variations do not follow similar alignments, most of the resources occur in areas where the alignments become closer to one another or intersect. Previously recorded sites identified along this route variation are located in all distance zones (refer to Section 3.2.13.4).

Potential impacts under Variation S5-B2 would be similar to Variation S5-B1, except for minor changes in the total mileages of cultural resource sensitivity (Table 3-450). A total of 1.0 mile of high cultural resource sensitivity is anticipated along this route variation compared to 1.1 miles along Variation S5-B1. These route variations have the potential for affecting the same previously recorded, high sensitivity site.

There are no known key resources identified along Variation S5-B2. There is the potential for direct effects on undocumented, archaeological sites along Variation S5-B2, primarily along the Owyhee River crossing.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S5-B2 would be those identified as common to all alternatives. If Variation S5-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Portions of Variation S5-B2 fall in a designated utility corridor (RMP Utility Corridor).

Malheur S Alternative

Under the Malheur S Alternative, there is the potential for direct and/or indirect effects on 100 previously recorded sites with different sensitivity indexes (high, moderate, or low) (41 more sites than the Applicant's Proposed Action Alternative). Of these sites, 5 have been categorized as high sensitivity, 6 as moderate sensitivity, and 89 as low sensitivity (Table 3-450). Previously recorded sites with a high sensitivity index consist of one pre-contact artifact scatter, the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail. These sites are crossed by this alternative route. Most of the previously recorded sites identified along this alternative route are located in the 0–250 feet and the 1,000 feet–2 miles distance zones (primarily in the 1,000 feet–2 miles distance zone [refer to Section 3.2.13.4]).

Potential impacts under the Malheur S Alternative would be similar to the Applicant's Proposed Action Alternative, except for moderate-high variations in the total mileages of cultural resource sensitivity (Table 3-450). A total of 3.0 miles of high cultural resource sensitivity is anticipated along this alternative route compared to 4.6 miles along the Applicant's Proposed Action Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Applicant's Proposed Action Alternative.

A key resource along the Malheur S Alternative is the Meek Cutoff Study Trail. One noncontributing segment of the trail is in the direct effects APE and also is crossed by this alternative route (refer to map MV-26 for inventory data). The Malheur S Alternative would have the same effects on the Study Trail as the Applicant's Proposed Action Alternative, since the two alternative routes share the same alignment where the trail is crossed. The Oregon NHT is located outside of the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails.

There are numerous sites of Native American concern (e.g., pre-contact rockshelters, pre-contact cairn) along this alternative route; most of these resources are in the indirect effects APE. In addition, there is

the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Negro Rock Canyon area (Native American concern) and the Malheur and Owyhee river crossings.

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Malheur S Alternative, except that the Malheur S Alternative is considerably closer to the Owyhee Dam Historic District. Therefore, the proximity of the alternative route to the historic district may contribute to other effects. Visual effects on historic resources are expected to be more intense.

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur S Alternative would be those identified as common to all alternatives. If the Malheur S Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The Malheur S Alternative's southern extension falls in designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Malheur A Alternative

Under the Malheur A Alternative, there is the potential for direct and/or indirect effects on 91 previously recorded sites with different sensitivity indexes (high, moderate, or low) (nine fewer sites than the Malheur S Alternative). Of these sites, 4 have been categorized as high sensitivity, 8 as moderate sensitivity, and 79 as low sensitivity (Table 3-450). Sites with a high sensitivity index consist of the South Canal, the Vale Canal, the Vines Ditch, and the Meek Cutoff Study Trail. These sites are crossed by this alternative route. Because the existing condition of the environment relevant to cultural resources is similar to the Malheur S Alternative, these two alternative routes are compared. Most of the previously recorded sites identified along this alternative route are located in the 0–250 feet and the 1,000 feet–2 miles distance zones (primarily in the 1,000 feet–2 miles distance zone [refer to Section 3.2.13.4]).

Potential impacts under the Malheur A Alternative would be similar to the Malheur S Alternative, except for moderate variations in the total mileages of cultural resource sensitivity (Table 3-450). A total of 1.7 miles of high cultural resource sensitivity are anticipated along this alternative route compared to 3.0 miles along the Malheur S Alternative. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along the Malheur S Alternative.

Key resources identified along this alternative route are the same as those identified along the Malheur S Alternative, since these two alternative routes are identical over the majority of their length (except where the B2H Project would be located north of the Grassy Mountain). The Malheur A Alternative would have the same effects on the Meek Cutoff Study Trail (noncontributing segment) as the Malheur S Alternative, since the two alternative routes share the same alignment where the trail is crossed (refer to map MV-26 for inventory data). The Oregon NHT is located outside of the study corridor. Section 3.2.15 presents the estimated effects of this portion of the B2H Project on NHTs and Study Trails

Both the Malheur A Alternative and the Malheur S Alternative pass through the Negro Rock Canyon, an area of Native American concern. There is the potential for direct effects on undocumented, significant sites along this alternative route, primarily along the Negro Rock Canyon area and the Malheur and Owyhee river crossings).

Cultural resources that potentially would be affected visually by this alternative route are similar to those identified along the Applicant's Proposed Action Alternative because these alternative routes roughly follow similar alignments, passing in proximity to the same resources. The Malheur A Alternative encompasses a portion of the Owyhee Dam Historic District. Therefore, the proximity of the alternative route to the historic district may contribute to other effects. Visual effects on historic resources are expected to be more intense.

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur A Alternative would be those identified as common to all alternatives. If the Malheur A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The Malheur A Alternative's southern extent shares segments with designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect the lowest number of previously recorded sites, followed by the Malheur A Alternative. The Malheur S Alternative potentially would affect the highest number of previously recorded sites. The majority of the previously recorded sites are in the indirect effects APE (over 63 percent) and have been classified as having a low sensitivity index (refer to Section 3.2.13.4).

Potential impacts on cultural resources would be similar along the three alternative routes in Segment 5, except for moderate to high variations in the total mileage of cultural resource sensitivity. The Applicant's Proposed Action Alternative crosses more miles of high cultural resource sensitivity than the Malheur S Alternative and the Malheur A Alternative, respectively. The potential for affecting a greater number of known, high sensitivity sites is also higher along the Applicant's Proposed Action Alternative.

No potential impacts on the Oregon NHT and trail-associated sites were identified, as segments of the Oregon NHT are not located in the study corridor. The closest segment of the trail (Southern Alternate Route of the Oregon NHT [Oregon – Idaho state border]) is located approximately 4.7 miles to the east of the alternative routes. Potential impacts on the Meek Cutoff Study Trail (previously recorded, noncontributing segment) would be the same for all three alternative routes, since these alternative routes follow the same alignment in proximity to the trail (the alternative routes cross the same segment of the trail).

Of the alternative routes considered for Segment 5, the Applicant's Proposed Action Alternative lies farther from historic resources associated with the Owyhee Dam Historic District (NRHP-listed). Potential impacts on historic resources associated with the historic district would be similar for the

Malheur S Alternative and the Malheur A Alternative, except that the Malheur A Alternative encompasses a portion of the historic district resulting in the potential for more intense impacts. In addition, the Applicant's Proposed Action Alternative avoids passing through an area of Native American concern (Negro Rock Canyon).

Variation S5-A2 potentially would affect a greater number of previously recorded sites than Variation S2-A1. Potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. These route variations do not cross any known area of high cultural resource sensitivity.

Variation S5-B1 potentially would affect the same number of previously recorded sites as Variation S5-B2. Although previously recorded sites are the same, potential impacts on those sites would be slightly different based on the proximity of the sites to the route variations. Variation S5-B1 crosses slightly more miles of high cultural resource sensitivity than Variation S5-B2. The potential for affecting previously recorded, high sensitivity sites is the same along these route variations.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

SEGMENT 6—TREASURE VALLEY

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, there is the potential for direct and/or indirect effects on 175 previously recorded sites with different sensitivity indexes (high, moderate, or low). Of these sites, 6 have been categorized as high sensitivity, 15 as moderate sensitivity, and 154 as low sensitivity (Table 3-451). Previously recorded sites with a high sensitivity index consist of one multi-component site (pre-contact rockshelter and historic inscriptions), one homestead, the Wilson Cemetery, the South Canal, the Beck Irrigation Ditch, and the U.S. Highway 95. The historic linear sites are crossed by this alternative route. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zones; however, there is a relatively high number of sites in other distance zones (refer to Section 3.2.13.4).

In the Applicant's Proposed Action Alternative, there are 5.2 miles of high, 15.6 miles of moderate, and 7.2 miles of low cultural resource sensitivity (Table 3-451).

Key resources identified along the Applicant's Proposed Action Alternative include the Wilson Cemetery, the WWII Marsing Bomb Range, the NRHP-listed Bernard's Ferry, the NRHP-listed Poison Creek Stage Station, the Southern Alternate Route of the Oregon NHT, and sites of Native American concern (human burial sites, cairns, and habitations [e.g., rockshelters, pithouses]). Of these resources, only one site (pre-contact rockshelter) is in the direct effects APE. There is the potential for direct

effects on undocumented historic road corridors along this alternative route. Regarding the NRHP-listed Poison Creek Stage Station, potential indirect adverse effects are expected to be low. The setting in this area has been compromised due to previous development of infrastructure. The BPA has already built a 500-kV transmission line within the viewshed of this historic property. Many of the outbuildings have been removed and the main habitation structure has undergone significant damage.

An additional key resource identified along this alternative route is Graveyard Point; this sensitive geographic area has been identified as a historic resource and is of importance to Native American tribes (refer to Section 3.2.14). Graveyard Point is in the indirect effects APE.

Cultural resources that potentially would be affected visually by this alternative route include the Map Rock Petroglyphs Historic District and the Givens Hot Springs area. These resources are located in the vicinity of the study corridor. There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, the Applicant's Proposed Action Alternative parallels an existing transmission line. The route's southern half also falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Variation S6-A1

There is the potential for direct and/or indirect effects on 52 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-A1. Of these sites, 1 site has been categorized as high sensitivity, 6 as moderate sensitivity, and 45 as low sensitivity (Table 3-451). The previously recorded site associated with a high sensitivity index is the South Canal. This historic linear site is crossed by the route variation. Previously recorded sites identified along this route variation are located in all distance zones (refer to Section 3.2.13.4).

In Variation S6-A1, there are 1.4 miles of high, 4 miles of moderate, and 3.9 miles of low cultural resource sensitivity (Table 3-451).

Key resources identified along Variation S6-A1 include the NRHP-listed Poison Creek Stage Station and Graveyard Point; these resources are located in the indirect effects APE. Numerous sites of Native American concern (e.g., cairns, rockshelters, rock alignment) have been identified along this route variation (refer to Section 3.2.14). The Southern Alternate Route of the Oregon NHT is in the vicinity of the study corridor for this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-A1 would be those identified as common to all alternatives. If Variation S6-A1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Table 3-451. Summary of Cultural Resources Inventory Data and Sensitivity for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Number of Previously Recorded Sites in The Study Corridor[1]																				
		NRHP-Eligible Sites			Not Eligible Sites			Unevaluated Sites									Sensitivity Index			Sensitivity (miles crossed)			
		Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Pre-contact	Historic	Multi-component	Unknown Temporal Affiliation[2]	Contributing Segments of the Oregon National Historic Trail[3]	NRHP-listed Properties	Total Number of Previously Recorded Sites	National Historic Trails[4]	Total Number of Sites in the Direct Effects Area of Potential Effects	Low	Moderate	High	None	Low	Moderate	High
Applicant's Proposed Action	28.0	6	5	3	7	15	0	94	27	12	3	1	2	175	1	26	154	15	6	0.0	7.2	15.6	5.2
Variation S6-A1	*9.3*	*3*	*3*	*1*	*1*	*3*	*0*	*33*	*0*	*7*	*0*	*0*	*1*	*52*	*0*	*15*	*45*	*6*	*1*	*0.0*	*3.9*	*4.0*	*1.4*
Variation S6-A2	*8.9*	*3*	*3*	*1*	*1*	*3*	*0*	*30*	*0*	*7*	*0*	*0*	*1*	*49*	*0*	*7*	*39*	*5*	*5*	*0.0*	*2.5*	*3.7*	*2.7*
Variation S6-B1	*14.4*	*5*	*5*	*2*	*3*	*10*	*0*	*60*	*16*	*6*	*3*	*1*	*1*	*112*	*1*	*10*	*99*	*9*	*4*	*0.0*	*3.3*	*9.6*	*1.5*
Variation S6-B2	*14.1*	*5*	*5*	*2*	*3*	*10*	*0*	*57*	*16*	*6*	*3*	*1*	*1*	*109*	*1*	*8*	*94*	*7*	*8*	*0.0*	*6.1*	*4.9*	*3.1*

Table Notes:

[1]Cultural resources identified during the reconnaissance level inventory for the visual assessment of historic properties are not included in the site counts. Results of the inventory are discussed qualitatively.

[2]Temporal affiliation for these sites was not provided in the site forms.

[3]Individual segments are considered to be "contributing" or "noncontributing" elements to the overall resource. Contributing segments retain sufficient integrity and were found to contribute to the overall eligibility of the historic linear site. Segment counts are based on Class I literature review provided by the BLM for the B2H Project (BLM 2014).

[4]The Southern Alternate Route of the Oregon National Historic Trail is included in the site counts, but is reiterated due to the trail's historical significance.

NRHP = National Register of Historic Places

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It should be noted that for the entirety of its length, Variation S6-A1 parallels an existing transmission line. The vast majority of this route variation also parallels two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Variation S6-A2

There is the potential for direct and/or indirect effects on 49 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-A2 (three fewer sites than Variation S6-A1). Of these sites, 5 have been categorized as high sensitivity, 5 as moderate sensitivity, and 39 as low sensitivity (Table 3-451). Sites with a high sensitivity index consist of two pre-contact rockshelters, one pre-contact rock alignment, the NRHP-listed Poison Creek Stage Station, and the South Canal. The historic linear site is crossed by this route variation. Most of the previously recorded sites identified along this route variation are located in the 250 feet–2 miles distance zones (refer to Section 3.2.13.4).

Potential impacts under Variation S6-A2 would be similar to Variation S6-A1, except for minor to moderate changes in the total mileages of cultural resource sensitivity sites (three fewer sites than Variation S6-A1) (Table 3-451). A total of 2.7 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.4 miles along Variation S6-A1. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S6-A2.

Key resources identified along Variation S6-A2 are the same as those identified along Variation S6-A1. However, Variation S6-A2 is considerably closer to the NRHP-listed Poison Creek Stage Station than Variation S6-A1 (approximately 60 feet east of Link 6-15 in the direct effects APE). As discussed under the Applicant's Proposed Action Alternative, potential indirect adverse effects on this historic property are expected to be low due to previous disturbance. The Southern Alternate Route of the Oregon NHT is in the vicinity of the study corridor.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-A2 would be those identified as common to all alternatives. If Variation S6-A2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The vast majority of Variation S6-A2 falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor). Additionally, this route variation closely parallels an existing transmission line.

Variation S6-B1

There is the potential for direct and/or indirect effects on 112 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-B1. Of these sites, 4 sites have been categorized as high sensitivity, 9 as moderate sensitivity, and 99 as low sensitivity (Table 3-451). Sites with a high sensitivity index consist of one multi-component site (pre-contact rockshelter and historic inscriptions), one homestead, the old U.S. Highway 95, and the South Canal. The old U.S. Highway 95 and the South Canal are crossed by this route variation. Most of the previously recorded sites identified along this route variation are located in the 250 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Variation S6-B1, there are 1.5 miles of high, 9.6 miles of moderate, and 3.3 miles of low cultural resource sensitivity (Table 3-451).

Key resources identified along Variation S6-B1 are the WWII Marsing Bomb Range, the NRHP-listed Poison Creek Stage Station, and the Southern Alternate Route of the Oregon NHT. These resources are in the indirect effects APE. Numerous sites of Native American concern (e.g., human burial sites, cairns, rock alignments, rockshelters, and the Alkali Springs Site [pre-contact village/campsite with a Paleoindian component]) have been identified along the study corridor (refer to Section 3.2.14).

Cultural resources that potentially would be affected visually by this route variation include the Map Rock Petroglyphs Historic District and the Givens Hot Springs area. These resources are located in the vicinity of the study corridor. There is the potential for undocumented, significant pre-contact sites near the Givens Hot Springs area in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-B1 would be those identified as common to all alternatives. If Variation S6-B1 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

It should be noted that for the entirety of its length, Variation S6-B1 closely parallels an existing transmission line. The vast majority of this route variation also falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor).

Variation S6-B2

There is the potential for direct and/or indirect effects on 109 previously recorded sites with different sensitivity indexes (high, moderate, or low) along Variation S6-B2 (three fewer sites than Variation S6-B1). Of these sites, 8 have been categorized as high sensitivity, 7 as moderate sensitivity, and 94 as low sensitivity (Table 3-451). Sites with a high sensitivity index consist of two pre-contact rockshelters, one pre-contact cairn, one pre-contact artifact scatter, two multi-component sites (pre-contact cairn and prospect; and pre-contact rockshelter and historic inscriptions), one homestead, and the old U.S. Highway 95. The historic road corridor is crossed by this route variation. Most of the previously recorded sites identified along this route variation are located in the 250 feet–2 miles distance zone (refer to Section 3.2.13.4).

Potential impacts under Variation S6-B2 would be similar than to Variation S6-B1, except for moderate changes in the total mileages of cultural resource sensitivity (Table 3-451). A total of 3.1 miles of high cultural resource sensitivity are anticipated along this route variation compared to 1.5 miles along Variation S6-B1. The potential for affecting a greater number of previously recorded, high sensitivity sites is higher along Variation S6-B2.

Key resources identified along Variation S6-B2 are the same as those identified along Variation S6-B1 because these route variations follow similar alignments, passing in proximity to the same resources.

Cultural resources that potentially would be affected visually by this route variation are the same as those identified along Variation S6-B1 because these route variations follow similar alignments, passing

in proximity to the same resources. Variation S6-B2 is slightly closer to resources associated with the NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area. There is the potential to encounter undocumented, significant pre-contact sites in the Givens Hot Springs area, along this route variation.

Without mitigation, the type of potential impacts (direct and indirect) of Variation S6-B2 would be those identified as common to all alternatives. If Variation S6-B2 is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The vast majority of Variation S6-B2 falls in two designated utility corridors (RMP Utility Corridor and West-wide Energy Corridor). Additionally, this route variation parallels an existing transmission line, but it lies farther from it.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect 175 previously recorded sites. The majority of these sites are in the indirect effects APE (over 85 percent). The Applicant's Proposed Action Alternative crosses 5.2 miles of high cultural resource sensitivity, attributed to six previously recorded sites with a high sensitivity index (refer to Section 3.2.13.4).

Variation S6-A1 potentially would affect a greater number of previously recorded sites than Variation S6-A2. Most of the previously recorded sites are in the indirect effects APE (over 87 percent) and have been classified as having a low sensitivity index. Potential impacts on those sites would be moderately different based on the proximity of the sites to the route variations. Variation S6-A2 crosses more miles of high cultural resource sensitivity than Variation S6-A1; therefore, Variation S6-A2 potentially would affect the highest number of previously recorded sites.

Similar to the Applicant's Proposed Action Alternative, key resources identified along Variation S6-A1 and S6-A2 include Graveyard Point, the NRHP-listed Poison Creek Stage Station, and numerous sites of Native American concern (e.g., rock features, rockshelters). Variation S6-A2 is located closer to Graveyard Point (historic resource and Native American concern) and the NRHP-listed Poison Creek Stage Station than the Applicant's Proposed Action Alternative. Unlike the Applicant's Proposed Action Alternative, Variation S6-A1 and Variation S6-A2 avoid the South Alternate Oregon Trail of the Oregon NHT, the NRHP-listed Bernard's Ferry, and pre-contact human burial sites (Native American concern).

Variation S6-B1 potentially would affect a greater number of previously recorded sites than Variation S6-B2. Most of the previously recorded sites are in the indirect effects APE (over 91 percent) and have been classified as having a low sensitivity index. Potential impacts on those sites would be different based on the proximity of the sites to the route variations. Variation S6-B2 crosses more miles of high cultural resource sensitivity than Variation S6-B1; therefore, Variation S6-B2 potentially would affect the highest number of previously recorded sites.

Similar to the Applicant's Proposed Action Alternative, key resources identified along Variation S6-B1 and Variation S6-B2, include the Southern Alternate Route of the Oregon NHT, the NRHP-listed Poison Creek Stage Station, and numerous sites of Native American concern (e.g., rock features, rockshelter, and village/campsite with a Paleoindian component [Alkali Springs Site]). The Applicant's Proposed Action Alternative (Link 6-35) is located closer to the NRHP-listed Poison Creek Stage Station and the Southern Alternate Route of the Oregon NHT (previously recorded, contributing segment) than the two route variations.

The NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area have been identified in proximity to the study corridor for the Applicant's Proposed Action Alternative, Variation S6-A1, and Variation S6-A2. Variation S3-A2 is located slightly closer to the aforementioned areas (vicinity of the study corridor). There is the potential for undocumented, archaeological sites (pre-contact and historic) near these significant areas.

Implementation of the B2H Project potentially would affect cultural resources. The quantity and significance (intensity) is unknown since an intensive Class III cultural resources inventory and evaluation for this specific action will not be conducted until a route is selected for construction. However, these impacts may be adverse and unavoidable. If impacts on historic properties or significant cultural resources cannot be avoided through B2H Project design, significant impacts would occur.

3.2.14 NATIVE AMERICAN CONCERNS

The analysis in this section addresses potential impacts on cultural resources of Native American concern, including historic properties of religious and cultural significance to Indian tribes, from implementation of the B2H Project.

In August 2008, the BLM formally initiated consultation with eight Native American sovereign tribal governments that have previously expressed connection to lands associated with the B2H Project area to inform them of the B2H Project and to inquire about their interest in continuing government-to-government consultation. In compliance with Section 106 of the NHPA and Executive Order 13751 (Consultation and Coordination with Indian Tribal Governments), the BLM initiated government-to-government consultation for the B2H Project by sending letters to Native American tribal governments on August 21, 2008. Letters were sent to the Burns Paiute Tribe, Confederated Tribes of the Colville Reservation, CTUIR, Confederated Tribes of the Warm Springs Indian Reservation of Oregon, Fort McDermitt Paiute and Shoshone Tribe, Nez Perce Tribe (including the Joseph Band of the Nez Perce), Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation. Subsequently, on May 4, 2011, a revised scoping report was mailed to the aforementioned eight tribal governments, the Columbia River Inter-Tribal Fish Commission, the Northwest Indian Fisheries Commission, and the following Native American tribal governments: Yakama Nation, Affiliated Tribes of Northwest Indians, Confederated Tribes of Grand Ronde, Klamath Tribe, Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Coquille Indian Tribe, Puyallup Tribe, Cow Creek Band of Umpqua Indians, Kalispel Tribe, Fort Bidwell Indian Community, Confederated Tribes of Siletz Indians, Spokane Tribe, and Samish Indian Nation. In addition, the BLM Vale District Office sent a letter inviting the Yakama Nation to participate in government-to-government consultation for the B2H Project on February 28, 2014. Ongoing staff-to-staff and government-to-government consultation and identification efforts between the BLM and the Burns Paiute Tribe, the CTUIR, the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation are being conducted to better capture tribal concerns with the B2H Project. Appendix A provides a record of government-to-government consultation activities for the B2H Project.

The Burns Paiute Tribe, the CTUIR, the Fort McDermitt Paiute and Shoshone Tribe, the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have expressed interest in the B2H Project and desire to review studies conducted on their ancestral lands. In addition to participating in government-to-government consultation for the B2H Project, the Burns Paiute Tribe, the CTUIR, and the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation also are participating as consulting parties in the Section 106 process.

As part of the scoping process, B2H Project updates were provided to Native American sovereign tribal governments (refer to Appendix A). Several coordination meetings were held with the BLM, Native American tribal governments, and THPO representatives to provide updates on the state of the B2H Project and ask the tribes' opinions on the identification of sites and areas of concern, and listen to any tribal concerns about the B2H Project. This process has provided Native American tribes potentially

affected by the undertaking, the opportunity to participate in the B2H Project and identify the potential effects of the implementation of the B2H Project on cultural resources of Native American concern and areas of interest. For information regarding Native American consultation and the results of consultation efforts to date, refer to Section 4.2.2.1, 4.2.2.2, and Appendix A.

3.2.14.1 Regulatory Framework

Tribal Rights and Interests

The United States has a unique legal relationship with federally recognized Indian tribes established through and confirmed by the Constitution of the United States, treaties, statutes, Executive orders, and judicial decisions. Federal government and Indian tribal relationships reflect the political and historical development of the Nation. The federal government's legal and political government-to-government consultation process is an expression of such fundamental legal principles as trust relationship, reserved rights, plenary powers, and tribal sovereignty. The U.S. recognizes Native American tribes as sovereign nations. Under the treaties, tribes ceded significant portions of their aboriginal lands to the United States. Generally, in return, tribes reserved separate, isolated reservation lands under the treaties and retained certain rights to hunt, fish, graze animals, and gather resources on unoccupied lands ceded to the United States. Native American tribes with ancestral ties to the land and interests related to Treaty and /or aboriginal rights in the B2H Project area include the Burns Paiute Tribe, Confederated Tribes of the Colville Reservation, CTUIR, Confederated Tribes of the Warm Springs Indian Reservation of Oregon, Fort McDermitt Paiute and Shoshone Tribe, Nez Perce Tribe, Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, and Yakama Nation.

The tribes consider portions of the B2H Project area to be part of their aboriginal territory, subsistence range, traditional use area, and/or zone of influence. Exercise of treaty rights could include hunting, fishing, gathering, pasture rights, water rights, and mineral rights on federal lands outside of the boundaries of their reservations.

Refer to Sections 3.2.3, 3.2.4, 3.2.6, 3.2.13, and 3.2.17 for further discussion of treaty rights from the perspective of vegetation, wildlife, land use, cultural, and socioeconomic resources, respectively.

Burns Paiute Tribe

Through government-to-government consultation with the BLM, the Burns Paiute Tribe of the Burns Paiute Reservation stated that the Tribe retains aboriginal rights to its traditional Great Basin homelands in central and eastern Oregon, Idaho, northern California, and northern Nevada. The Burns Paiute Tribe recognizes that its Great Basin culture and the cultural and natural resources found throughout its aboriginal territory are invaluable, irreplaceable, and endangered elements of the Tribe's heritage. Therefore, the Burns Paiute Tribe has developed an Aboriginal Territorial Protection Policy "to help preserve, and protect the past, present, and future elements of the Tribe's culture, and to satisfy the Tribe's goals for uniform standards and procedures applicable to all units of the Tribal government in responding to state and federal investigations involving cultural and archaeological site disturbance,

disinterment, and other destructive activities within the Tribe's aboriginal territory" (Burns Paiute Indian Tribe, Aboriginal Territorial Protection Policy, Resolution No. 2006-12). A substantial portion of the B2H Project in eastern Oregon is in the former Malheur Indian Reservation.

Confederated Tribes of the Umatilla Indian Reservation

The Umatilla Indian Reservation was created by the treaty with the Walla Walla, Cayuse, and Umatilla in 1855 (12 Stat., 945), under which the Cayuse, Umatilla, and Walla Walla ceded more than 6.4 million acres of their traditional territory in northeast Oregon and southeast Washington. Today the Umatilla Indian Reservation is approximately 172,000 acres. The U.S. Constitution (Article II, Section 2, Clause 2) provides that treaties are equal to federal laws and are binding on states as the supreme law of the land. A majority of the B2H Project area passes through lands ceded to the U.S. government by the 1855 Treaty with the CTUIR. Federal agencies have the legal responsibility to consult with the CTUIR and consider the conditions necessary to satisfy the rights reserved by the tribe as part of its treaty. The CTUIR have reserved explicit hunting, fishing, gathering, and pasturing rights in that treaty. Exercise of treaty rights could include, but is not limited to, water rights; taking fish; mineral rights; collection of plant resources, such as roots and berries; and hunting of small and large game for economic, religious, and cultural use. Treaty rights also include pasturing stock on unclaimed lands. The CTUIR actively work with the U.S. Government in natural resource planning efforts to protect their off-reservation treaty rights. Off-reservation resources on federal lands that Native American tribes may have legal interests in are commonly referred to as Indian Trust Assets.

Shoshone-Bannock Tribes of The Fort Hall Indian Reservation

On July 3, 1868, the Eastern Band Shoshone and Bannock Tribes and the U.S. signed the Fort Bridger Treaty (15 Stat. 673). In the treaty the tribes reserved certain rights outside of their reservation boundaries, including hunting, fishing, gathering, and grazing. The Bannock and other bands of Shoshone were guaranteed a permanent homeland, which ended up being in southeast Idaho, known as the Fort Hall Indian Reservation. The Fort Bridger Treaty of 1868, specifically Article IV, states that the tribes "have the right to hunt on the unoccupied lands of the U.S. so long as game may be found thereon, and so long as peace subsists among the whites and Indians on the borders of the hunting districts."

Shoshone-Paiute Tribes of The Duck Valley

Through government-to-government consultation with the BLM, the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation maintain that the tribes possess "aboriginal title" to their traditional homelands, which are crossed by the B2H Project. The Shoshone-Paiute Tribes believe that title to these lands has not been relinquished and they continue to claim title, rights, and interests associated with these lands. They are a contemporary living and dynamic culture that still practice their traditions in the B2H Project area and, therefore, any B2H Project impacts are of concern to the tribes. In addition, the tribes are concerned about B2H Project effects on cultural and natural resources considered to be culturally or spiritually important that are beyond the scope of Section 106 of the NHPA. These resources may include aspects of the importance and interrelatedness of plants, animals, humans,

objects, viewsheds, landscapes, and places in the continuing social, cultural, and spiritual fabric of the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation.

INDIAN RESERVATIONS

The Umatilla Indian Reservation is located within the B2H Project area in Umatilla County. Although the alternative routes do not cross reservation lands, indirect effects of the B2H Project on CTUIR lands will be considered. Land use on the Umatilla Indian Reservation is governed by the Confederated Tribes' Land Development Code (CTUIR 2016). However, since the B2H Project does not cross CTUIR lands, the Confederated Tribes' Land Development Code does not govern the placement of the transmission lines.

FEDERAL LEGISLATION APPLICABLE TO CULTURAL RESOURCES OF NATIVE AMERICAN CONCERN

Pursuant to 36 CFR Part 800.2, the lead federal agency must consult with Native American sovereign tribal governments that attach religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location or land status of the historic property. In such cases, the federal agency is obligated to consult with federally recognized Native American tribal governments potentially affected by the undertaking and give those Native American tribal governments the opportunity to participate in government-to-government consultation for the B2H Project should they wish to do so.

Federal legislation, manual handbooks, and policies applicable to tribal consultation in the B2H Project area are listed below. Many of these regulations also apply to the protection of cultural resources and are described in Section 3.2.13.

- **National Historic Preservation Act** (NHPA) (54 U.S.C. 300101 et seq.; 36 CFR Part 800), specifically Section 106 of the NHPA (54 U.S.C. 306108), directs federal agencies to take into account the effects of their actions on historic properties and provide Native American sovereign tribal governments a reasonable opportunity to comment.
- **American Indian Religious Freedom Act of 1978** (AIRFA) (42 U.S.C. 1996), requires federal agencies to protect and preserve the customs, ceremonies, and traditions of American Indian religions.
- **Archaeological Resources Protection Act of 1979** (ARPA)(54 U.S.C. 302101), amended in 1988, authorizes federal land-managing agencies to manage through a permit process the excavation or removal, or both, of archaeological resources on federal lands. These agencies must consult with Native American sovereign tribal governments with interests in resources prior to issuance of permits. In addition, the law sets penalties for the damage, defacement, unpermitted excavation, or removal of archaeological resources on federal lands.
- **Native American Graves Protection and Repatriation Act 1990** (NAGPRA) (25 U.S.C. 3001 to 3002) provides a process through which federal agencies consult with affected Native

Americans regarding the treatment and return of human remains, funerary objects, sacred objects, and items of cultural patrimony identified on federal lands.

- **Religious Freedom Restoration Act of 1993** (RFRA) (42 U.S.C. 2000bb to 2000bb-4), amended in 2003, prohibits federal agencies from substantially burdening any person's exercise of religion, even if the burden results from a rule of general applicability, except if the federal agencies demonstrate that application of the burden to the person is in furtherance of a compelling governmental interest and is the least restrictive means of furthering that compelling governmental interest.
- **Executive Order 13007, Indian Sacred Sites**, issued in 1996, directs federal land-managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.
- **Executive Order 13107, Implementation of Human Rights Treaties**, directs all agencies to comply with obligations under international human rights treaties.
- **Executive Order 13175, Consultation and Coordination with Indian Tribal Governments**, issued in 2000, underscores the existing requirement for regular and meaningful government-to-government consultation between the federal government and tribal officials.
- **Secretarial order 3175, Departmental Responsibilities for Indian Trust Resources,** requires Interior bureaus and offices to consult with the recognized tribal government with jurisdiction over the trust property that a proposal may affect.
- **Bureau Manual Handbook H-8120-1, Guidelines for Conducting Tribal Consultation,** (Transmitted December 3, 2004), assists BLM managers and staff members in carrying out their assigned tribal consultation responsibilities and goals. Its goal is to help assure that federally recognized tribal governments and Native American individuals, whose traditional uses of public land might be affected by a proposed BLM action, will have sufficient opportunity to contribute to the decision, and that the decision maker will give tribal concerns proper consideration.
- **Government-to-Government Relations with Native American Tribal Governments Memorandum,** signed by President Clinton on April 29, 1994, 59 *Federal Register* 22951 (May 4, 1994) directs federal agencies to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. Federal agencies must assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during such development.
- **Presidential Memorandum on Tribal Consultation**, November 5, 2009, reaffirms "Executive Order 13175, Consultation and Coordination with Indian Tribal Governments," and emphasized the importance of strengthening government-to-government relationships with Native American sovereign tribal governments.
- **Secretarial Order 3175, Departmental Responsibilities for Indian Trust Resources,** requires Interior bureaus and offices to consult with the recognized tribal government with

jurisdiction over the trust property that a proposal may affect (Section 2 Reorganization Plan No. 3 of 1950 – 64 Stat. 1262; November 8, 1993).

- **Secretarial Order 3206,** issued in 1997 by the Secretary of the Interior and the Secretary of Commerce pursuant to the ESA (16 U.S.C. 1531, as amended), the federal-tribal (i.e., government-to-government) trust relationship, and other federal law. The order directs component agencies of the USDOI and the Department of Commerce to carry out their responsibilities under the ESA in a manner that harmonizes the federal trust responsibility to Native American tribes, sovereign tribal governments, and statutory missions of the departments, and that strives to ensure that Indian tribes do not bear a disproportionate burden for the conservation of listed species.
- **Secretarial Order 3335, Reaffirmation of the Federal Trust Responsibility to Federally Recognized Indian Tribes and Individual Indian Beneficiaries**, sets forth guiding principles that bureaus and offices will follow to ensure that the Department of Interior fulfills its trust responsibility.
- **USDOI Policy on Consultation with Indian Tribes**, outlines the USDOI's consultation framework for fulfilling its tribal consultation obligations, including requirements for government-to-government consultation between tribal officials and department officials.
- **BLM IM No. 2012-061**, explains the key differences between the 1997 national Programmatic Agreement the BLM maintains with the ACHP and National Conference of SHPOs, and the revised Programmatic Agreement. The IM summarizes the actions that the BLM Washington Office and state and field offices, must take to fulfill the responsibilities under the NHPA.

STATE LEGISLATION APPLICABLE TO CULTURAL RESOURCES OF NATIVE AMERICAN CONCERN

Oregon statutes and guidelines pertaining to tribal consultation and/or the handling of inadvertently discovered Native American human remains on state and private lands in the B2H Project area include the following:

- **ORS 390.235**, Permits and Conditions for Excavation or Removal of Archaeological or Historic Material; Rules; Criminal Penalty and its associated OAR (736-051-0080 to 736-051-0090)
- **ORS Chapter 97.740 to 97.760**, Indian Graves and Protected Object

Oregon EFSC certificate requirements:

- **OAR 345-022-0090**, protects the public interest in preserving places that have historic, cultural or archaeological significance, including sites of historic or religious importance to Native American tribes. The standard preserves historic and cultural artifacts and prevents permanent loss of the archaeological record unique to particular sites in the state.

Idaho statutes and guidelines pertaining to tribal consultation and/or the handling of inadvertently discovered human Native American human remains on state and private lands in the B2H Project area include the following:

- **Idaho Code Title 27, Chapter 5, Sections 27-502 to 27-504**, Protection of Graves.

Refer to Section 3.2.13 for federal legislation and state statutes or guidelines applicable to cultural resources in the B2H Project area.

3.2.14.2 Issues Identified for Analysis

Based on the results of preliminary research (Class I literature search and Class II cultural resources inventory) and coordination and consultation with Native American sovereign tribal governments potentially affected by the B2H Project, Native American concerns focus on the following issues[1]:

- NEPA process and how cultural resources will be addressed;
- Level of planning and participation involved in the B2H Project and the role of Native American tribes;
- Tribal consultation process;
- Programmatic Agreement;
- NAGPRA Plan of Action documents;
- Completion of Ethnographic studies;
- Effects on traditional foods and treaty rights, where applicable;
- Cultural resources site visits and historic properties of religious and cultural significance to Indian tribes/TCPs inventories;
- Direct and indirect effects on cultural resources that may be relevant to Native American tribes, including historic properties of religious and cultural significance to Indian tribes, cultural landscapes (e.g., mountains, ridges, springs, rivers, rock formations and rockshelters), and human burial sites;
- Effects on places/areas of Native American concern. Key resources include Sand Hollow, Pilot Rock, Farewell Bend, Graveyard Point, McKay Creek, Birch Creek, Striped Mountain, and Butter Creek;
- Effects on the Oregon NHT (path of the Forced March of 1879);
- Forced March of 1879;
- Tribal involvement in monitoring;
- Cumulative effects of the B2H Project;
- Mitigation;
- Colocation;
- Confidentiality;
- Communication protocols;
- Human remains and repatriation;

[1]Additional Native American concerns have been raised during ongoing consultation.

- Impacts on greater sage-grouse and other wildlife;
- Public health and safety issues; and
- Increased access to sites and the potential for increased looting and damage.

Some Native American tribes have expressed concerns that construction, operation, and maintenance activities will negatively affect plant and animal populations important to Native American tribes and result in restricted access to sacred sites/areas. In addition, Native American tribes are concerned that these activities will impair ceremonial use of sacred sites/areas by tribal members through the following[2]:

- Alteration of the broader site context; spiritual abandonment of sacred sites;
- Disruption of the visual qualities of the landscape;
- Physical desecration of sites, objects, and cultural material;
- Distraction of ceremonial participants;
- Electrical Interference (EMF) with the spiritual environment;
- Loss of ceremonial objects, cultural materials, and medicines (plant life);
- Increased accessibility to the area by others;
- Eventual site abandonment by spiritual practitioners.

The following discussion summarizes specific Native American concerns with the review process and cultural resources issues (primarily potential effects on specific geographic areas [key areas]) raised to date. For further information regarding consultation efforts to date, refer to Section 4.2.2.1 and Appendix A.

The Burns Paiute Tribe has expressed interest in the B2H Project and the desire to review studies conducted on their ancestral lands. The Burns Paiute Tribe would like to participate in field visits.

The CTUIR expressed interest in the B2H Project and the desire to review studies conducted on their ancestral lands. The CTUIR expressed concern regarding the level of effort (pedestrian inventory of 15-percent sample of lands in the direct effects APE) employed to identify historic properties. In addition, the proximity of the B2H Project to Sand Hollow, Pilot Rock, and Butter Creek is a concern for the tribes.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation and the Fort McDermitt Paiute and Shoshone Tribes expressed interest in the B2H Project and the desire to review studies conducted on their ancestral lands. These tribes expressed concern about the limited definition of “historic properties” under Section 106 of the NHPA and are pursuing development of a separate agreement document with the BLM to address their concerns about B2H Project effects on those cultural resources considered important to them. Although the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have indicated a specific interest in the area from the Oregon-Idaho state border to Malheur City (historic town site), Malheur County, Oregon and additional concerns in the Durkee and Huntington areas in

[2]Additional Native American concerns have been raised during ongoing consultation.

Oregon, their interest is not limited to these areas. The tribe is concerned with the entirety of their ancestral homeland. The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have expressed concern regarding colocation, monitoring, and mitigation. The tribes also expressed concern about being able to tell the story of the Forced March of 1879 alongside the history of the Oregon NHT. Potential effects on segments of the Oregon NHT that were associated with the Forced March of 1879 are a paramount concern for the tribes. The Forced March of 1879 is considered to be a spiritually significant event to these tribes, and potential B2H Project impacts on the route of the forced march continue to be evaluated through government-to-government consultation. The tribes also expressed concern regarding the effects of EMF on cultural resource sites, fish, wildlife, and vegetation. In addition, the proximity of the B2H Project to Graveyard Point is a concern for the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation.

Overall, issues raised by Native American tribes related to potentially significant effects on cultural resources include potential direct and indirect effects on archaeological and historic cultural resources, and historic properties of religious and cultural significance to Indian tribes. Cultural resources considered of particular significance include trade sites, habitation sites (e.g., caves, rockshelters, and villages), natural features (e.g., mountains, springs, buttes, rock formations, and ridges), rock image sites, rock features (e.g., cairns and rock alignments), historic trails, battle sites, human burial sites, sites associated with ceremonies and legends, and sites associated with hunting, fishing, gathering, or other rights reserved by treaty. Some of these resources have the potential to become historic properties of religious and cultural significance to Indian tribes through consultation with Native American tribal governments.

Specifically, Native American tribes have expressed concern about the B2H Project proximity to Pilot Rock, Sand Hollow Battlefield 1848, Butter Creek, Farewell Bend, Graveyard Point, Striped Mountain, and the McKay Creek area. Additional concerns include the Oregon NHT, sites considered sacred to Native American tribes associated with the Forced March of 1879, and traditional foods and plant-gathering areas. Refer to Sections 3.2.3, 3.2.4, 3.2.5, and 3.2.13 for additional information on traditional foods from the perspective of vegetation, wildlife, fish, and cultural resources, respectively. There is the potential for sites of tribal significance (rock features) in the Huntington and Durkee areas. Tribal input indicates that these features could represent cultural landscapes in Oregon. The previously mentioned cultural resources do not represent a complete list of sites or areas important to Native American tribes. Ongoing coordination and consultation with Native American tribal governments may identify additional resources of tribal concern.

The presence and/or introduction of EMF in the B2H Project area have been reported, through government-to-government consultation, to be of concern to Native American tribes. These tribes have expressed that areas in which EMF are present would be rendered unsuitable for cultural and religious practices. Potential impacts of EMF will be discussed in government-to-government consultation between the BLM and the appropriate Native American sovereign tribal governments, as requested by the BLM. The potential impacts of EMF from the B2H Project are described in Section 3.2.18.

As mentioned in Section 3.2.13, ethnographic studies have been undertaken by the CTUIR and Shoshone-Paiute Tribes of the Duck Valley Indian Reservation to assist with the identification of historic properties of religious and cultural significance to Indian tribes and other cultural resources of concern to the tribes. The CTUIR study also conducted a sample inventory for the presence of traditional foods and traditional plant resources considered culturally significant to Native American tribes in the study corridor. The aforementioned inventory is part of the Ethnographic study. The CTUIR has identified at least 45 known NRHP-eligible historic properties of religious and cultural significance to Indian tribes in, or near, the study corridor that could be affected by the B2H Project. The CTUIR has further indicated the existence of a cultural landscape used for procurement of traditional foods resources that extends over a large portion of the Applicant's Proposed Action study corridor from the B2H Project's intersection with McKay Creek, west of the Blue Mountains to Clover Creek, northeast of the community of North Powder. The Burns Paiute Tribe is in the process of conducting an ethnographic study.

3.2.14.3 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project on Native American concerns.

ANALYSIS AREA

The study corridor for cultural resources of Native American concern is the same as that described in Section 3.2.13.

CULTURAL RESOURCES INVENTORY

Cultural resources inventory data on known resources of significance to Native American tribes were used to describe the affected environment for the Proposed Action, alternative routes, and route variations. The study methods include a review of cultural resources site data, historic properties of religious and cultural significance to Indian tribes, ethnographic studies, government-to-government consultation, tribal correspondence, communication records, and tribal meeting notes that address potential Native American concerns in or adjacent to the study corridor.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Criteria for Assessing Level of Impacts

Criteria for assessing potential effects on cultural resources of Native American concern associated with the implementation of the B2H Project are the same as criteria described in Section 3.2.13.

Sites and/or areas of tribal significance identified through the Class I literature search and Class II inventory efforts are not necessarily representative of all resources of tribal significance that are present in the study corridor. Therefore, additional criteria for assessing level of impacts were based on the presence or absence of significant resources and potentially significant resources of tribal concern that may be encountered in the study corridor, as identified through Native American consultation.

Effects Analysis

Assessment of Initial Impacts

The initial cultural resource sensitivity was assigned using the criteria presented in Section 3.2.13.4. Impacts on cultural resources of Native American concern primarily are characterized in a qualitative manner. Class III cultural resources inventory will be completed for the Selected Route in compliance with the requirements of Section 106 of the NHPA as detailed in the Programmatic Agreement (Appendix I) for the B2H Project. Upon completion of the Class III inventory, further tribal consultation will be conducted to avoid and minimize impacts on resources of tribal concern to the extent possible and to ensure that any unidentified resources of tribal significance are identified and appropriate mitigation is developed.

Mitigation Planning

Specific mitigation measures for cultural resources of Native American concern would be developed by the BLM in consultation with the appropriate Native American tribal government, or governments, and would be implemented to mitigate any identified adverse effects. Avoidance and preservation are the preferred treatment to eliminate or reduce adverse effects on resources of Native American concern. Avoidance may include design changes or relocation of specific components of the B2H Project.

3.2.14.4 Cultural Context

The cultural context for resources of Native American concern is the same as that presented in Section 3.2.13.

3.2.14.5 Cultural Resources Inventory Summary

Types of Potential Effects

The construction, operation, and maintenance of the B2H Project potentially would result in both direct and indirect adverse effects on cultural resources of Native American concern. Potential impacts on resources of Native American concern, including historic properties of religious and cultural significance to Indian tribes, are similar to those outlined in Section 3.2.13 for all cultural resources. Potential impacts (direct and indirect) would be discussed in government-to-government consultation between the BLM and the appropriate Native American sovereign tribal governments, as requested by the BLM. Additionally, ongoing tribal consultation, in accordance with NHPA, NAGRPA, and other relevant federal legislation, would help determine other issues of concern.

Native American tribes that are historically associated with the B2H Project area may consider cairns, rock alignments, habitation sites, rock images, human burial sites and grave goods, battle grounds, trail systems, natural landscape features, hunting and fishing areas, and plant-gathering areas, among other resources, as highly sensitive. Additional Class III inventory will likely result in the identification of more and/or different site types.

The aforementioned resources are seen as living systems rather than a collection of artifacts and features, randomly demarcated sites, or disjointed resources, and they incorporate a series of

interconnected physical and spiritual elements. Potential impacts on cultural resources of tribal significance, therefore, are not limited to direct or indirect effects on these resources but can extend to the surrounding landscape.

Accordingly, input from Native American tribes was essential in determining the significance of certain sites and areas in the B2H Project area. For instance, one of the areas (among others) was of particular concern to the CTUIR. This area, which reaches from the B2H Project's intersection with McKay Creek, west of the Blue Mountains to Clover Creek, northeast of the community of North Powder, encompasses a cultural landscape used extensively for the procurement of traditional foods resources. As this area extends through a large part of the B2H Project area and encompasses a variety of resources, it is not discussed separately for each segment.

EFFECTS COMMON TO ALL ALTERNATIVES

Potential impacts on sites in the direct effects APE could include direct and permanent ground disturbance associated with the construction of tower locations, ancillary facilities, and access roads; and direct and indirect permanent disturbance due to changes in public accessibility (i.e., the introduction of new or improved access roads). Potential impacts on sites in the indirect effects APE could include direct and indirect permanent disturbance due to changes in public accessibility; and direct and indirect long-term visual, atmospheric, and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility. These types of disturbance could damage or destroy cultural resources if not mitigated.

The potential for the discovery of unanticipated cultural resources during construction, construction monitoring, or operation and maintenance activities of the B2H Project exists in the direct effects APE and could result in adverse effects. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the resources involved. Displacement of cultural resources affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Any cultural resources, human remains or funerary objects discovered at any time during construction, construction monitoring, or operation and maintenance activities will be treated in accordance with the Inadvertent Discovery Plan contained in the HPMP.

Over the entire length of the B2H Project, there is the potential for direct and/or indirect effects on cultural resources of tribal significance. In accordance with the Programmatic Agreement for the B2H Project, once an alternative has been selected, a complete Class III intensive pedestrian inventory would be conducted along the entire route and all roads and facilities as part of the Class III study. All sites in the direct effects APE would be documented and evaluated for eligibility for the NRHP, and sites located in the indirect effects APE that meet the criteria established for potential visual sensitivity also would be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, Native American sovereign tribal governments participating in the B2H Project, and the SHPOs, who would then determine if the B2H Project has the potential to have an adverse effect on historic properties under NHPA. Prior to construction activities in

the area, any adverse effects on historic properties would need to be resolved per 36 CFR Part 800.6. With regard to treaty rights, treaty rights are non-Section 106 issues B2H Project impacts on cultural resources have the potential to affect tribal exercise of tribal treaty rights (e.g. the B2H Project may affect success in gathering traditional foods) but not the treaty rights themselves. Therefore treaty rights are not anticipated to be affected by the Section 106 aspect of the B2H Project. Because site-specific impacts cannot be identified or quantified at this stage in B2H Project development, only a general discussion on the types of potential impacts can be presented; however, while the types of impacts would be the same or similar, the number of resources to be potentially affected may differ between alternative routes and route variations

Specific mitigation measures for cultural resources of Native American concern would be developed by the BLM in consultation with the appropriate Native American tribal government, or governments, and would be implemented to mitigate any identified adverse effects. Since the Navy is not participating on the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property (Segment 1). Specific mitigation for Navy property will be developed by the Navy in consultation with the sovereign tribal governments.

SEGMENT 1—MORROW-UMATILLA

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: 2 pre-contact cairns, 1 pre-contact habitation site (pithouse), 1 pre-contact culturally modified trees (bark-peeled ponderosa trees) locale, and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 12 pre-contact lithic scatters, 4 pre-contact lithic and tool scatters, 1 pre-contact lithic procurement area, 1 pre-contact campsite, and 1 pre-contact ceramic scatter. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879). Additional sites and places of religious and cultural significance to Indian tribes have been identified as areas of specific concern by the CTUIR including two historic properties in the NWSTF Boardman, the Sand Hollow Battlefield, sites near Pilot Rock, and the McKay Creek area. These resources are briefly described below. Two historic properties of religious and cultural significance to Indian tribes (NRHP-eligible) were identified during a traditional use survey of lands in the NWSTF Boardman. This inventory was conducted in 2013 by the CTUIR (Navy 2015). The NWSTF Boardman and vicinity are part of the ceded lands of the Umatilla, Cayuse, and Walla Walla tribes as well as a small portion of the ceded lands of the Yakama Nation. The two historic properties of religious and cultural significance to Indian tribes have been identified in the direct and indirect effects APEs for this alternative route.

The CTUIR expressed concern about the Sand Hollow Battlefield 1848 and sites of tribal significance near Pilot Rock; these resources are located in the indirect effects APE for this alternative route.

The Applicant's Proposed Action Alternative also passes through a cultural landscape in the McKay Creek area, east of U.S. 395 in Umatilla County. The CTUIR has identified this area as a "cultural landscape." The McKay Creek area is important for both pre-contact and historic resources and is a

place of importance in the contemporary culture of the tribe. There is the potential for direct effects on undocumented, sites of tribal significance that may exist along this portion of the study corridor. The CTUIR also expressed their concern about the potential for direct effects on undocumented sites (primarily rock features) of tribal significance along Link 1-77 (southeast of Kamela).

Based on the ethnographic records, there are known, unspecified places of tribal significance along this alternative route.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

East of Bombing Range Road Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative, except for one additional site (pre-contact lithic scatter) along the East of Bombing Range Road Alternative. The differences in site type occur along Link 1-25 (south of the Longhorn Substation). Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are the same as those identified along the Applicant's Proposed Action Alternative. Although the alternative routes do not share the same alignment south of the Longhorn Substation, they are in proximity to one another, and the same resources are identified for both alternative routes. Southeast of the NWSTF Boardman, the alternative routes join at Link 1-43, and follow the same alignment across the McKay Creek area. Both the East of Bombing Range Road Alternative and the Applicant's Proposed Action Alternative are in proximity to two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman, sites of tribal significance near Pilot Rock and southeast of Kamela, and Sand Hollow Battlefield 1848. Of these cultural resources, the two historic properties of religious and cultural significance to Indian tribes are located in the direct and indirect effects APEs for this alternative route. The East of Bombing Range Road Alternative is slightly closer to Sand Hollow Battlefield 1848 than the Applicant's Proposed Action Alternative.

Based on the ethnographic record, there are unspecified places of tribal significance along the East of Bombing Range Road Alternative. In addition, there is the potential for direct effects on undocumented, sites of tribal significance that may exist along this alternative route.

Without mitigation, the type of potential impacts (direct and indirect) of the East of Bombing Range Road Alternative would be those identified as common to all alternatives. If the East of Bombing Range Road Alternative is selected, the same Class III intensive pedestrian inventory and reporting

procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Applicant's Proposed Action – Southern Route Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those along the Applicant's Proposed Action Alternative, except for one additional site (pre-contact campsite) along the Applicant's Proposed Action Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared (from Longhorn Substation to Pilot Rock and east of Rocky Ridge). Sites are in the indirect effects APE, except for one cairn (documented as historic) and the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the Applicant's Proposed Action – Southern Route Alternative avoids crossing the McKay Creek area and lies slightly farther from significance sites near Pilot Rock. Key resources are similar because they occur in areas where the alternative routes share an alignment, or are in proximity to one another.

There is the potential for direct effects on undocumented, sites of tribal significance that may exist along this alternative route.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action – Southern Route Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

West of Bombing Range Road – Southern Route

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those identified along the Applicant's Proposed Action, except for one additional site (pre-contact campsite) along the West of Bombing Range Road – Southern Route Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared (south of the Longhorn Substation and east of Rocky Ridge). Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the West of Bombing Range Road – Southern Route Alternative avoids crossing the McKay Creek area. Compared to the Applicant's Proposed Action, the West of Bombing Range Road – Southern Route Alternative also lies

farther from resources of tribal concern near Pilot Rock. Key resources are similar because they occur in areas where the alternative routes share an alignment, or are in proximity to one another.

Based on the ethnographic record, the Birch Creek also is an area of tribal significance along this alternative route. Birch Creek is located approximately 5 miles to the southwest of Link 1-64, just southwest of the community of Pilot Rock. There is the potential for undocumented, significant sites (including rockshelters) that may be relevant to Native American tribes to occur in or near this area (indirect effect APE).

Without mitigation, the type of potential impacts (direct and indirect) of the West of Bombing Range Road – Southern Route Alternative would be those identified as common to all alternatives. If the West of Bombing Range Road – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed. Since the Navy is not participating in the Programmatic Agreement prepared for the B2H Project, there is no Class III intensive survey planned on Navy property. The area has already been surveyed for cultural resources, and the adverse effects on the known sites will be mitigated.

Longhorn Alternative

Previously recorded sites of tribal significance, identified along the Longhorn Alternative, are similar to those identified along the Applicant's Proposed Action Alternative, except for four additional pre-contact sites (lithic scatter, lithic and tool scatter, campsite, and lithic procurement area) along the Applicant's Proposed Action Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared. Except for the initial north-south portion exiting the Longhorn Substation, the Longhorn Alternative and the Applicant's Proposed Action Alternative follow the same alignment. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except that the Longhorn Alternative avoids the Sand Hollow Battlefield 1848 and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman (western extent of the alternative route). The NWSTF Boardman is located 5 miles to the west of this alternative route. Most of the key resources identified along this alternative route occur in areas where the alternative routes share an alignment (from the Sand Hollow area onto the Wallowa-Whitman National Forest).

The CTUIR expressed concern about Butter Creek. The western extent of the Longhorn Alternative lies approximately 5 miles from this culturally significant, geographic feature.

Without mitigation, the type of potential impacts (direct and indirect) of the Longhorn Alternative would be those identified as common to all alternatives. If the Longhorn Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Interstate 84 Alternative

Under the Interstate 84 Alternative, the following sites of tribal significance have been previously recorded: 1 pre-contact human burial site (grave goods), 1 pre-contact cairn site, 1 pre-contact habitation site (pithouse), 1 pre-contact culturally modified trees (bark-peeled ponderosa trees) locale, and 6 historic trails (Oregon NHT [path of the Forced March of 1879] and “Indian Trails”). Other sites that are of tribal significance include 11 pre-contact lithic scatters, 3 pre-contact lithic and tool scatters, 1 pre-contact artifact scatter, 1 pre-contact lithic procurement area, and 1 pre-contact ceramic scatter. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

The Interstate 84 Alternative passes through the McKay Creek area. There is the potential for direct effects on undocumented, sites of tribal significance that may exist along this alternative route. The Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman. There are additional resources of tribal concern near Pilot Rock and southeast of Kamela.

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 Alternative would be those identified as common to all alternatives. If the Interstate 84 Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Interstate 84 – Southern Route Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are the same as those identified along the Interstate 84 Alternative, except for one additional site (pre-contact campsite) along the Interstate 84 – Southern Route Alternative. Most of the sites are the same because they occur in the areas where the alignments are shared (from Longhorn Substation [to the east/southeast] to Pilot Rock and east of Rocky Ridge). Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879). Because the affected environment and the existing condition of the environment relevant to cultural resources is similar to the Interstate 84 Alternative, these two alternative routes are compared.

Key resources of Native American concern, located along this alternative route, are similar to those identified along the Interstate 84 Alternative, except that the Interstate 84 – Southern Route Alternative avoids the McKay Creek area and lies slightly farther from significant sites near Pilot Rock. Key resources identified along these alternative routes are similar because they occur in areas where the alternative routes share an alignment, or are in proximity to one another. As described for the Interstate 84 Alternative, the Interstate 84 Alternative avoids the Sand Hollow Battlefield 1848 and the two historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman.

Without mitigation, the type of potential impacts (direct and indirect) of the Interstate 84 – Southern Route Alternative would be those identified as common to all alternatives. If the Interstate 84 – Southern Route Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

The CTUIR indicated that the Interstate 84 – Southern Route Alternative would have the fewest effects on cultural resources of significance to them.

Conclusions

Based on areas with existing inventories, all of the alternative routes assessed in Segment 1 potentially would affect a similar number of sites of tribal significance. Although site types are similar along these alternative routes, there are several site types identified along two of the seven alternative routes (Interstate 84 Alternative and Interstate Alternative 84 – Southern Route Alternative) that are not along the other alternative routes; these sites include one pre-contact human burial site and "Indian Trails." Most of the previously recorded sites of tribal significance identified along the alternative routes assessed in Segment 1 are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Segment 1, the CTUIR expressed concern about four of the seven alternative routes due to the presence of two previously recorded historic properties of religious and cultural significance to Indian tribes (NRHP-eligible resources) in the NWSTF Boardman (western extent of the alternative routes). These resources are located in the direct and indirect effects APEs for the Applicant's Proposed Action Alternative, the East of Bombing Range Road Alternative, the Applicant's Proposed Action – Southern Route Alternative, and the West of Bombing Range Road – Southern Route Alternative. The Longhorn Alternative, the Interstate 84 Alternative, and the Interstate 84 – Southern Route Alternative avoid these sensitive resources.

The CTUIR also expressed concern about crossing the cultural landscape in the McKay Creek area. Of the seven alternative routes, only the West of Bombing Range Road – Southern Route Alternative and the Interstate 84 – Southern Route Alternative avoid this highly sensitive area. The Interstate 84 – Southern Route Alternative was not addressed in the Draft EIS and is the result of a route-variation option recommended by the CTUIR DNR. The CTUIR DNR suggested extending the north-south portion of the Interstate 84 Alternative (Link 1-49) farther south to connect with the Applicant's Proposed Action – Southern Route Alternative (east of U.S. Highway 395), thereby avoiding the McKay Creek area.

The CTUIR also expressed their concern about the potential for direct effects on undocumented sites (primarily rock features) of tribal significance along Link 1-77 (southeast of Kamela). All of the alternative routes assessed in Segment 1 share the same alignment along this portion of the study corridor.

With regard to the Oregon NHT (path of the Forced March of 1879), potential impacts on the trail under all seven alternative routes would be similar, except that Interstate 84 Alternative and the Interstate 84 – Southern Route Alternative, are located farther from previously recorded, contributing segments of the trail, which would result in less impact. Shoshone-Paiute tribal history indicates that the Oregon NHT through the B2H Project area was a part of the route that their people traveled during the Forced March of 1879. This forced relocation is considered by tribal governments as a particularly significant event in their history, during which many men, women, and children died and their bodies were left unburied along the trail. The Forced March of 1879 is considered to be a spiritually significant event to

these tribes, and potential B2H Project impacts on the route traveled during the forced march continue to be evaluated through government-to-government consultation.

SEGMENT 2—BLUE MOUNTAINS

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: eight rock features (cairns and rock alignments), one pre-contact habitation site (pithouses), and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 32 pre-contact lithic scatters, 6 pre-contact lithic and tool scatters, and 1 pre-contact artifact scatter. There also are several multi-component sites (pre-contact lithic scatters, campsite, pre-contact ceramic scatter, and pre-contact lithic procurement area with historic components). Of the previously recorded sites of tribal significance, one cairn of unknown temporal affiliation, one pre-contact lithic scatter, one pre-contact lithic scatter/historic artifact scatter, and unrecorded segments of the Oregon NHT (path of the Forced March of 1879) are in the direct effects APE.

There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes.

One historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) has been identified along one of the route variations (Variation S2-B2) considered for the Applicant's Proposed Action Alternative. This resource is in the indirect effects APE.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Glass Hill Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for six additional pre-contact sites (lithic scatters, lithic and tool scatter, and lithic scatter/habitation) along the Applicant's Proposed Action Alternative. Sites identified along these two alternative routes are similar because they occur in the areas where the alignments are shared. The Glass Hill Alternative and the Applicant's Proposed Action Alternative are identical over the majority of their length (except where the B2H Project would be located southwest of La Grande). Most of the sites are in the indirect effects APE, except for one cairn of unknown temporal affiliation and the Oregon NHT (path of the Forced March of 1879).

There is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes.

Without mitigation, the type of potential impacts (direct and indirect) of the Glass Hill Alternative would be those identified as common to all alternatives. If the Glass Hill Alternative is selected, the same

Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Mill Creek Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative. Fifteen additional pre-contact sites of tribal significance have been identified along the Mill Creek Alternative. These sites include 9 lithic scatters, 1 lithic and tool scatter, 1 lithic procurement area, 1 campsite, 1 historic property of religious and cultural significance for an Indian tribe (traditional fishery/campsite), and 2 multi-component sites (pre-contact lithic scatters/historic artifact scatter and pre-contact lithic and tool scatter/historic artifact scatter). Although the alternative routes do not follow similar alignments, most of the sites occur in the areas where the alignments become closer to one another or intersect. Most of the sites are in the indirect effects APE, except for two pre-contact lithic scatters, one multi-component site (pre-contact lithic procurement area/historic artifact scatter), and the Oregon NHT (path of the Forced March of 1879).

The Mill Creek Alternative is closer to the historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation) than the route variations (Variation S2-B2) considered for the Applicant's Proposed Action Alternative. This highly sensitive resource is in the indirect effects APE for both the Mill Creek Alternative and Variation S2-B2.

The Mill Creek Alternative avoids undocumented, significant sites in the Glass Hill area.

Without mitigation, the type of potential impacts (direct and indirect) of the Mill Creek Alternative would be those identified as common to all alternatives. If the Mill Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Mill Creek Alternative potentially would affect the highest number of previously recorded sites of tribal significance, followed by the Applicant's Proposed Action Alternative. The Glass Hill Alternative potentially would affect the fewest number of previously recorded sites of tribal significance. One site identified along the Mill Creek Alternative, but not along the other two alternative routes includes one historic property of religious and cultural significance to an Indian tribe (traditional fishery/campsite of historic temporal affiliation). This highly sensitive resource also has been identified along one of the route variations (Variation S2-B2) considered for the Applicant's Proposed Action Alternative, in the indirect effects APE. The Mill Creek Alternative is slightly closer to this highly sensitive resource (indirect effects APE). Most of the previously recorded sites of tribal significance identified along the alternative routes assessed in Segment 2 are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

With regard to the Oregon NHT (path of the Forced March of 1879), potential impacts on the trail under all three alternative routes would be similar, except that the Glass Hill Alternative, is located farther from

previously recorded, contributing segments of the trail (southwest of La Grande), which would result in less impact. All three alternative routes cross an unrecorded segment of the trail.

In the Applicant's Proposed Action Alternative and the Glass Hill Alternative, there is the potential for direct effects on undocumented, significant sites in the Glass Hill area. These resources are of interest to Native American tribes. The Mill Creek Alternative avoids undocumented, significant sites in the Glass Hill area.

SEGMENT 3—BAKER VALLEY

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: five rock features (cairns and rock alignments) and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 8 pre-contact lithic scatters, 2 pre-contact lithic procurement areas, 1 pre-contact lithic and tool scatter, 1 pre-contact artifact scatter, and 1 pre-contact hunting blind. Sites are in the indirect effects APE, except for one pre-contact lithic and tool scatter and the Oregon NHT (path of the Forced March of 1879).

Key areas of Native American concern, Burnt River Canyon and Durkee, are located along four of the six route variations (Variations S3-C3 through S3-C6) considered for the Applicant's Proposed Action Alternative. There is the potential for direct effects on unrecorded, significant sites (primarily rock features) along these areas, primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County. The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation expressed concern about the proximity of the B2H Project to the Durkee area. There is the potential for direct and/or indirect effects on undocumented, significant cultural resources in or near this area.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for four additional sites along the Flagstaff A Alternative. Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include 1 pre-contact lithic scatter, 1 pre-contact lithic and tool scatter, 1 undetermined structural/cairn site, and 1 rock alignment of unknown temporal affiliation. Most of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and east/southeast of Lone Pine Mountain), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact lithic and tool scatter and the Oregon NHT (path of the Forced March of 1879).

There is the potential for direct effects on unrecorded, significant sites (primarily rock features) along the Durkee area (area of concern to the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation). The Flagstaff A Alternative avoids an area of Native American concern (Burnt River Canyon).

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A Alternative would be those identified as common to all alternatives. If the Flagstaff A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Timber Canyon Alternative

Under the Timber Canyon Alternative, the following sites of tribal significance have been previously recorded: 23 rock features (cairns and rock alignment), 2 pre-contact habitation sites (rockshelters), 1 pre-contact medicine wheel, 1 pre-contact structural site/rock alignment of unknown function, and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 33 pre-contact lithic scatters, 24 pre-contact lithic and tool scatters, 5 pre-contact lithic procurement areas, 1 pre-contact hunting blind, and 13 multi-component sites (pre-contact lithic scatters, pre-contact lithic and tool scatter, and pre-contact lithic procurement area with historic components [mining and farming/ranching-related]). Sites are in the indirect effects APE, except for one pre-contact lithic scatter, one pre-contact lithic and tool scatter/historic artifact scatter, and the Oregon NHT (path of the Forced March of 1879).

The Medical Hot Springs, and its surroundings, have been identified as being of importance to Native American tribes. The Medical Hot Springs is situated approximately 2 miles to the south of this alternative route, in the indirect effects APE. The Timber Canyon avoids the Burnt River Canyon area.

Without mitigation, the type of potential impacts (direct and indirect) of the Timber Canyon Alternative would be those identified as common to all alternatives. If the Timber Canyon Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff A – Burnt River Mountain Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for 12 additional sites along the Flagstaff A – Burnt River Mountain Alternative. These sites include 5 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 2 pre-contact lithic procurement areas, 2 pre-contact rock alignments, and 1 pre-contact structural site/cairns of unknown function. Some of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and between the Dry Creek area and Ranch Creek), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact cairn site and the Oregon NHT (path of the Forced March of 1879).

The Burnt River Canyon and Durkee areas are located along this alternative route. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these areas, primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff A – Burnt River Mountain Alternative would be those identified as common to all alternatives. If the Flagstaff A – Burnt River Mountain Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for slight variations in the number of sites and site types. Sites identified along this alternative route, but not along the Applicant's Proposed Action Alternative, include one pre-contact lithic and tool scatter, one pre-contact structural site/cairn of unknown function, and one rock alignment of unknown temporal affiliation. In addition, the Flagstaff B Alternative has one less pre-contact lithic scatter than the Applicant's Proposed Action Alternative. Most of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and east/southeast of Lone Pine), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact lithic and tool scatter and the Oregon NHT (path of the Forced March of 1879).

There is the potential for direct effects on unrecorded, significant sites (primarily rock features) in the Durkee area. The Flagstaff B Alternative avoids an area of Native American concern (Burnt River Canyon).

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B Alternative would be those identified as common to all alternatives. If the Flagstaff B Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Burnt River West Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for 12 additional sites along the Flagstaff B – Burnt River West Alternative. These sites include 5 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 2 pre-contact lithic procurement areas, 2 pre-contact rock alignments, and 1 pre-contact structural site/cairns of unknown function. Sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and between the Dry Creek area and Ranch Creek), or are in proximity to one another. Sites are in the indirect effects APE, except for one pre-contact cairn site and the Oregon NHT (path of the Forced March of 1879).

The Burnt River Canyon and Durkee areas are located along this alternative route. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these areas,

primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Burnt River West Alternative would be those identified as common to all alternatives. If the Flagstaff B – Burnt River West Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Flagstaff B – Durkee Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those identified along the Applicant's Proposed Action Alternative, except for 11 additional sites of tribal significance along the Flagstaff B – Durkee Alternative. These include 5 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 1 pre-contact lithic procurement area, 1 pre-contact rock alignment, 1 pre-contact structural site/cairns of unknown function, and 1 rock alignment of unknown temporal affiliation. Most of the sites identified along these alternative routes occur in the areas where the alignments are shared (North Powder Valley and between the Dry Creek area and Ranch Creek), or are in proximity to one another. Sites are in the indirect effects APE, except for the Oregon NHT (path of the Forced March of 1879).

The Burnt River Canyon and Durkee areas are located along this alternative route. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these sensitive areas, primarily within the boundaries of the Burnt River Canyon, west/southwest of the Durkee Valley, Baker County. Of the alternative routes considered under Segment 3, the Flagstaff B – Durkee lies farther from the Durkee area. There is the potential for direct effects on undocumented, significant sites south of Alder Creek and west of the Durkee Valley.

Without mitigation, the type of potential impacts (direct and indirect) of the Flagstaff B – Durkee Alternative would be those identified as common to all alternatives. If the Flagstaff B – Durkee Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Timber Canyon Alternative potentially would affect the highest number of previously recorded sites of tribal significance. The other six alternative routes potentially would affect a similar number of sites, since they roughly follow similar alignments. The Applicant's Proposed Action Alternative potentially would affect the fewest number of previously recorded sites of tribal significance, closely followed by the Flagstaff Alternative and the Flagstaff B Alternative, respectively. Most of the previously recorded sites of tribal significance identified along the alternative routes assessed in Segment 3 are located in the 1,000 feet–2 miles distance zone. The Oregon NHT (path of the Forced March of 1879) is located in the direct effects APE for all seven alternative routes.

In Segment 3, the tribes expressed concern about the Timber Canyon Alternative due to the presence of the Medical Hot Springs, and its surroundings, in proximity to this alternative route. The Medical Hot Springs is situated approximately 2 miles to the south of the Timber Canyon Alternative, in the indirect effects APE. The other six alternative routes avoid this sensitive area.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation have expressed concern about four of the seven alternative routes (Applicant's Proposed Action Alternative, Flagstaff A – Burnt River Mountain Alternative, Flagstaff B – Burnt River West Alternative, and Flagstaff B – Durkee Alternative) due to their proximity to the Burnt River Canyon and Durkee areas. There is the potential for direct effects on unrecorded, significant sites (e.g., rock features) along these culturally significant areas. The Burnt River Canyon and Durkee areas also have been identified along four of the six route variations (Variations S3-C3 through S3-C6) considered for the Applicant's Proposed Action Alternative. The Flagstaff A Alternative, the Timber Canyon Alternative, and the Flagstaff B Alternative avoid the Burnt River Canyon area.

SEGMENT 4—BROGAN

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: seven pre-contact rock features (cairns and rock alignment) and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 37 pre-contact lithic scatters, 11 pre-contact lithic and tool scatter, 1 pre-contact artifact scatter, and 6 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters and pre-contact lithic scatter/historic artifact scatter). Most of the sites are in the indirect effects APE. The Oregon NHT (path of the Forced March of 1879) is in the indirect effects APE.

There are not known, key resources of tribal significance along the Applicant's Proposed Action Alternative.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Tub Mountain South Alternative

Under the Tub Mountain South Alternative, the following sites of tribal significance have been previously recorded: 11 rock features (cairns and rock alignments), 2 pre-contact human burial sites, 1 pre-contact habitation site (rockshelter), and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 26 pre-contact lithic scatters, 19 pre-contact lithic and tool scatters, 9 pre-contact lithic procurement areas, 9 pre-contact campsites, 1 pre-contact ceramic scatter, 1 pre-contact game trap, and 9 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters, pre-contact lithic scatters/historic artifact scatters, pre-contact campsite/foundation, and pre-contact artifact scatter/homestead). Most of the sites are in the indirect

effects APE, except for one pre-contact lithic scatter, one multi-component site (pre-contact lithic and tool scatter/historic artifact scatter), and the Oregon NHT (path of the Forced March of 1879). The Tub Mountain South Alternative crosses five undocumented, intact segments of the Oregon NHT (path of the Forced March of 1879). Of the alternative routes considered under Segment 4, the Tub Mountain South Alternative has the highest number of Native American concerns.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, the Burns Paiute Tribe, and the CTUIR have expressed concerns about the Tub Mountain South Alternative and its proximity to the Farewell Bend. This culturally significant area is a major tribal river crossing and tribal gathering area. This alternative route passes within 1 mile of Farewell Bend. One broad cultural landscape that includes important pre-contact and historic cultural resources extends from the Farewell Bend area to the south. There is potential for direct effects on unrecorded, significant sites of tribal significance in or near this area. The CTUIR supports paralleling the transmission line and I-84 to the Farewell Bend area, but preferred the route to cross over to the Willow Creek Alternative to avoid potential impacts on the cultural landscape south of the Farewell Bend area.

Without mitigation, the type of potential impacts (direct and indirect) of the Tub Mountain South Alternative would be those identified as common to all alternatives. If the Tub Mountain South Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Willow Creek Alternative

Under the Willow Creek Alternative, the following sites of tribal significance have been previously recorded: 16 rock features (cairns and rock alignment) 1 pre-contact rock image site, and the Oregon NHT (path of the Forced March of 1879). Other sites that are of tribal significance include 37 pre-contact lithic scatters, 10 pre-contact lithic and tool scatter, 6 multi-component sites (pre-contact lithic and tool scatters/historic artifact scatters and pre-contact lithic scatter/historic artifact scatter). Most of the sites are in the indirect effects APE. The Oregon NHT (path of the Forced March of 1879) is in the indirect effects APE.

The Striped Mountain area is located west of the Willow Creek Alternative in the indirect effects APE. This significant, geographic feature has been identified as being important to Native American tribes. There is the potential for direct effects on unrecorded, significant sites of tribal significance near this sensitive area. Holt Pictograph site is situated in the valley near the Striped Mountain (southeast end) and in the vicinity of the study corridor. The site is on private property.

Without mitigation, the type of potential impacts (direct and indirect) of the Willow Creek Alternative would be those identified as common to all alternatives. If the Willow Creek Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Tub Mountain South Alternative potentially would affect the highest number of previously recorded sites of tribal significance, followed by the Willow Creek Alternative. The Applicant's Proposed Action Alternative potentially would affect the fewest number of previously recorded sites. Most of the previously recorded sites of tribal significance identified along this alternative route are located in the 250 feet–2 miles distance zone (primarily in the 1,000 feet-2 miles distance zone [refer to Section 3.2.13.4]).

In Segment 4, the tribes have expressed concern about the proximity of the B2H Project to the Striped Mountain area. This significant geographic feature is located west of the Willow Creek Alternative in the indirect effects APE. There is the potential for direct effects on unrecorded, significant sites of tribal significance near this sensitive area. In addition, the Holt Pictograph site is situated in the valley near the Striped Mountain (southeast end) and in the vicinity of the study corridor for the Willow Creek Alternative.

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, the Burns Paiute Tribe, and the CTUIR have expressed concerns about the proximity of the B2H Project to Farewell Bend (major tribal river crossing and tribal gathering area). This alternative route passes within 1 mile of Farewell Bend. There would be substantive impacts on a broad cultural landscape that incudes significant pre-contact and historic cultural resources extending from the Farewell Bend area to the south. There is potential for direct effects on unrecorded, significant sites of tribal significance in or near this area. The CTUIR supports paralleling the transmission line and I-84 to the Farewell Bend area, but preferred the route to cross over to the Willow Creek Alternative to avoid potential impacts on the cultural landscape south of the Farewell Bend area.

The Applicant's Proposed Action Alternative and the Willow Creek Alternative would have the lowest overall impact on the Oregon NHT (path of the Forced March of 1879) because these alternative routes are located farther from the trail (the Applicant's Proposed Action Alternative being the farthest). Under the Tub Mountain South Alternative, five unrecorded, intact segments of the trail would be crossed by the B2H Project (Link 4-75).

Of the alternative routes considered under Segment 4, the Tub Mountain South Alternative has the highest number of Native American concerns.

SEGMENT 5—MALHEUR AREA

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: 16 pre-contact lithic scatters, 14 pre-contact lithic and tool scatters, 3 pre-contact campsites, 1 pre-contact cairn, 1 pre-contact artifact scatter, and 2 multi-component sites (pre-contact campsite/historic artifact scatter and pre-contact lithic scatter/shed). Sites are in the indirect effects APE, except for 6 pre-contact lithic and tool scatter, 4 pre-contact lithic scatters, and 1 pre-contact campsite. This alternative route avoids the Oregon NHT (path of the Forced March of 1879).

There are not known, key areas of Native American concern along the Applicant's Proposed Action Alternative.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Malheur S Alternative

Under the Timber Canyon Alternative, the following sites of tribal significance have been previously recorded: 3 pre-contact rockshelter, 1 pre-contact cairn, and 1 pre-contact structural site/rock alignment of unknown function. Other sites that are of tribal significance include 38 pre-contact lithic scatters, 17 pre-contact lithic and tool scatters, 4 pre-contact campsites, 2 pre-contact lithic procurement areas, 2 pre-contact artifact scatters, and 5 multi-component sites (pre-contact campsite, pre-contact lithic scatters, lithic and tool scatters, and pre-contact campsites with historic components [primarily farming/ranching-related components]). Sites are in the indirect effects APE, except for 4 pre-contact lithic and tool scatters, 2 pre-contact lithic scatters, and 1 pre-contact lithic scatter. This alternative route avoids the Oregon NHT (path of the Forced March of 1879).

The Malheur S Alternative passes through the Negro Rock Canyon area, east of Sand Hollow in Malheur County. The Negro Rock Canyon area has been identified as being important to Native American tribes.

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur S Alternative would be those identified as common to all alternatives. If the Malheur S Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Malheur A Alternative

Previously recorded sites of tribal significance, identified along this alternative route, are similar to those as those identified along the Malheur S Alternative, except for eight fewer sites along the Malheur A Alternative. Sites identified along the Malheur S Alternative, but not along the Malheur A Alternative, include 3 pre-contact lithic scatters, 2 pre-contact lithic and tool scatters, 1 pre-contact artifact scatter, 1 pre-contact campsite, and 1 pre-contact rockshelter. Most of the sites identified along these alternative routes are the same because they occur in the areas where the alignments are shared (between Bully Creek and Sand Hollow Creek [north of Grassy Mountain), or are in proximity to one another. Sites are in the indirect effects APE, except for three pre-contact lithic and tool scatter and one pre-contact lithic scatter. This alternative route avoids the Oregon NHT (path of the Forced March of 1879). Because the affected environment and the existing condition of the environment relevant to cultural resources is similar to the Malheur S Alternative, these two alternative routes are compared.

Like the Malheur S Alternative, the Malheur A Alternative crosses the Negro Rock Canyon area (east of Sand Hollow in Malheur County).

Without mitigation, the type of potential impacts (direct and indirect) of the Malheur A Alternative would be those identified as common to all alternatives. If the Malheur A Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Malheur S Alternative potentially would affect the highest number of previously recorded sites of tribal significance, closely followed by Malheur A Alternative. The Applicant's Proposed Action Alternative potentially would affect the fewest number of known sites of tribal significance. The three alternative routes avoid the Oregon NHT (path of the Forced March of 1879). Most of the previously recorded sites of tribal significance identified along these alternative routes are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4).

In Segment 5, the tribes expressed concern about the Malheur S Alternative and the Malheur A Alternative due to their proximity to the Negro Rock Canyon area (east of Sand Hollow in Malheur County). There is the potential for direct effects on undocumented, significant sites of tribal significance in or near this sensitive area. The Applicant's Proposed Action Alternative avoids the Negro Rock Canyon area. There are not known, key areas of Native American concern along the Applicant's Proposed Action Alternative.

SEGMENT 6—TREASURE VALLEY

Applicant's Proposed Action Alternative

Under the Applicant's Proposed Action Alternative, the following sites of tribal significance have been previously recorded: 20 pre-contact habitation sites (rockshelters and village/campsite [Alkali Springs Site]), 10 rock features (cairns and rock alignment), 3 pre-contact human burial sites, and the Oregon NHT (Southern Alternate Route [path of the Forced March of 1879]). Other sites that are of tribal significance include 34 pre-contact lithic scatters, 20 pre-contact lithic and tool scatters, 12 pre-contact campsites, 7 pre-contact lithic procurement areas, 3 pre-contact artifact scatters, 1 pre-contact processing station, and 11 multi-component sites pre-contact (lithic scatters, pre-contact lithic procurement area, pre-contact cairn, and pre-contact rockshelter with historic components). Sites are in the indirect effects APE, except for 9 pre-contact lithic scatters, 1 pre-contact lithic and tool scatter, 1 pre-contact processing station, and 5 multi-component sites (pre-contact lithic scatters, and pre-contact rock shelter with historic components).The Oregon NHT (Southern Alternate Route [path of the Forced March of 1879]) is in the indirect effects APE.

Graveyard Point has been identified as being of importance to the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation. This culturally sensitive, geographic area is situated approximately 1 mile to the north/northeast the Applicant's Proposed Action Alternative in the indirect effects APE. One extensive, pre-contact lithic procurement area has been documented within the boundaries of this prominent landform and in the indirect effects APE for this alternative route.

There is the potential to encounter undocumented, significant pre-contact sites near the Map Rock Petroglyph Historic District (NRHP-listed) and the Givens Hot Springs (northwest of Melba, Idaho, west of the Snake River). These resources are of interest to the tribes.

Without mitigation, the type of potential impacts (direct and indirect) of the Applicant's Proposed Action Alternative would be those identified as common to all alternatives. If the Applicant's Proposed Action Alternative is selected, the same Class III intensive pedestrian inventory and reporting procedures, outlined under the effects common to all alternatives, would be employed.

Conclusions

Based on areas with existing inventories, the Applicant's Proposed Action Alternative potentially would affect a high number of previously recorded sites of tribal significance. Most of the previously recorded sites identified along this alternative route are located in the 1,000 feet–2 miles distance zone (refer to Section 3.2.13.4). The Oregon NHT (Southern Alternate Route [path of the Forced March of 1879]) is in the indirect effects APE.

Tribal input from the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation indicates the Tribes' preference for Variation S6-A1 (Applicant's Proposed Action Alternative) instead of Variation S6-A2, since Variation S6-A1 (Applicant's Proposed Action Alternative) lies farther from Graveyard Point. This culturally sensitive area is situated over 1 mile to the north/northeast of Variation S6-A2 in the indirect effects APE. One extensive, pre-contact lithic procurement area has been documented within the boundaries of this prominent landform in the indirect effects APE for Variation S6-A1 (Applicant's Proposed Action Alternative) and Variation S6-A2.

There also is the potential to encounter undocumented, significant pre-contact sites near the Map Rock Petroglyph Historic District (NRHP-listed) and the Givens Hot Springs (northwest of Melba, Idaho, west of the Snake River). These sites are of interest to the tribes.

3.2.15 National Historic Trails and Trails Under Study for Congressional Designation

3.2.15.1 Introduction

The U.S. Congress established the NTSA under Public Law 90-543 in 1968 to provide for the ever-increasing outdoor recreation needs of an expanding population and in order to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation. Section 7(c) of the NTSA requires that "Other uses along the trail, which will not substantially interfere with the nature and purposes of the trail, may be permitted by the Secretary charged with the administration of the trail. Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable, efforts shall be made to avoid activities incompatible with the purposes for which such trails were established." Section 3(a) provides that NHTs shall have as their purpose the identification and protection of the historic route and its historic remnants and artifacts for public use and enjoyment, and that selected components are included as federal protection components. The Secretary of the Interior, under Section 9(a) may grant rights-of-way upon, over, under, across, or along any component of the National Trails System, provided that any conditions contained in such easements and rights-of-way shall be related to the policy and purposes of this Act. Two such congressionally designated NHTs—the Oregon NHT and the Lewis and Clark NHT, administered by the NPS under the NTSA, are located in the study corridor. Also included in the study corridor are five trails under study or recommended as suitable for congressional designation by the NPS under the NTSA —referred to as Study Trails in this document—the Meek Cutoff, Goodale's Cutoff, Olds Ferry Road, Umatilla River Route and Columbia River to The Dalles, and Upper Columbia River Route. The following discussion describes the nature and purposes of the NHTs; values, characteristics, and settings of the Study Trails; and provides a detailed analysis of the adverse impacts of the B2H Project and proposed mitigation. The analysis includes impacts on the trail's management, including nature and purpose; visual and recreation resources; cultural and historic resources; and biological resources, natural resources, and other resources. For the Final EIS, the inventory of trail resources on BLM-administered lands, as included in Appendix B.8 of the Draft EIS, was supplemented with data across all lands to form a consistent inventory baseline to compare different alternative routes while being compliant with BLM Manual 6280, *Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation (Public)* (BLM 2012).

It is important to note that as NHTs are multi-resource, congressionally designated components under the NTSA, the analysis of adverse impacts on NHTs is a multidisciplinary undertaking; but to avoid repetition and subdividing of the analysis into multiple resource sections, the assessment of visual impacts on NHTs and the assessment of both direct and indirect impacts on NHTs are presented in this section. Note also that the analysis that responds to and fulfills the requirements of Section 106 (54 U.S. Code [U.S.C.] 306108) of the NHPA (54 U.S.C. 300101 et seq.) is included in Section 3.2.13.

3.2.15.2 Regulatory Framework

National Trails System Act

The NTSA authorized the establishment of the National Trails System, which includes four categories of National Trails: National Scenic Trails, NHTs, National Recreation Trails, and Connecting or Side Trails. The Connecting or Side Trails serve to provide access to the other three categories of trail. When initially enacted, the NTSA established two trails, the Appalachian and Pacific Crest National Scenic Trails. Since that time, and through additional acts of Congress, 30 National Trails have been identified. Both of the NHTs present in the B2H Project area—the Oregon NHT and the Lewis and Clark NHT—were established in 1978 by Public Law 95-25. The NTSA also directs the Secretary of the Interior or the Secretary of the Agriculture to administer and manage designated National Trails. Section 5(b) of the NTSA charges these two authorities with conducting feasibility studies to identify and designate additional National Trails (Study Trails). Five Study Trails are located within the B2H Project area: the Goodale's Cutoff, Meek Cutoff, Upper Columbia River Route, Olds Ferry Road, and Umatilla River Route and Columbia River to The Dalles. The feasibility of adding these trails to the Oregon NHT currently is being studied by the NPS as part of the larger Four Trails Feasibility Study, authorized by Congress under the Omnibus Public Lands Act of 2009.

Section 7(c) of the NTSA charges the Secretaries to consider the effects of proposed actions on designated National Trails. The NTSA states that the Secretary charged with administration of the NHT may permit other uses along the trail provided that they do not "substantially interfere with the nature and purpose of the trail." Furthermore Section 7(c) specifies, "Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable… avoid activities incompatible with the purposes for which such trails were established." In this regard, easements or rights-of-way granted by the Secretary of the Interior or Secretary of Agriculture must comply with laws applicable to the National Park System and the National Forest System and conditions established in the easements or rights-of-way must reflect the policy and purposes of the NTSA Section 9(a).

National Historic Preservation Act

Section 106 of the NHPA requires that the federal agency permitting a project or action "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register" and provide the ACHP an opportunity to comment. Effect is defined in the implementing regulations for Section 106 (36 CFR §800.16(i)) as an "alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." Section 106 requires the lead federal agency to consult with the State Historic Preservation Office, members of the public, affected Native American tribes, and the ACHP throughout the process of identification, evaluation, and resolution of effects. Subpart C of 36 CFR Part 800 outlines program alternatives to the standard Section 106 process. One of these is the use of a Programmatic Agreement. The regulations state that a Programmatic Agreement may be used when effects on historic properties cannot be fully determined prior to approval of an undertaking. The Programmatic Agreement is a legally binding document among the involved state and federal agencies, tribes, the ACHP, and consulting parties, that records the terms and conditions agreed upon to resolve the

potential adverse effects of a complex undertaking in accordance with 36 Code of Federal Regulations 800.14(b) and in compliance with Section 106 of the National Historic Preservation Act. The Programmatic Agreement outlines the stipulations that would be followed concerning the identification, assessment, and treatment of cultural resources for the Project

The Oregon NHT and the Lewis and Clark NHT, as well as the Meek Cutoff, Goodale's Cutoff, Upper Columbia River Route, Olds Ferry Road, and Umatilla River Route and Columbia River to The Dalles Study Trails, include segments and sites that require evaluation of effect under Section 106. Segments and sites associated with the trail located in the direct and indirect effects APE established for the B2H Project will be assessed through a reconnaissance survey and intensive level survey associated with the Section 106 process. B2H Project effects will be determined in consultation with Native American sovereign tribal governments and parties to the Programmatic Agreement. Section 3.2.13 describes the Section 106 process in more detail, including required mitigation and analyses to meet Section 106 requirements.

FEDERAL LAND POLICY AND MANAGEMENT ACT

The FLPMA governs the manner in which public lands shall be managed. This act, also known as the BLM Organic Act, establishes the agency's "multiple-use mandate to serve and protect future generations" (BLM and Office of the Solicitor 2001). The concept of "multiple-use" management is defined within the act (43 U.S.C. 1702) as "management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people."

FLPMA Sec. 302(a) provides that the BLM "shall manage the public lands under principles of multiple use and sustained yield, in accordance with the land-use plans developed by him under Section 202 of this Act when they are available, except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such law – such as the NTSA."

BUREAU OF LAND MANAGEMENT MANUAL 6280

Congressionally Designated Trails

The BLM must meet the management standard for congressionally designated trails (Chapter 1.6 of BLM Manual 6280), and follow the protocol for proposed actions which may adversely impact them (Chapter 5.3 of BLM Manual 6280).

As directed in the protocol and the management standard, the BLM may not permit proposed uses along National Trails which will substantially interfere with the nature and purposes of the trail (NTSA Sec. 7(c)) and the BLM shall make efforts, to the extent practicable, to avoid authorizing activities that are incompatible with the purposes for which such trails were established. If the proposed project is not initially rejected, denied, or deferred, the protocol and management standard procedures are followed.

When a National Trail Management Corridor has not yet been established in the affected land-use plans, the BLM first undertakes a viewshed analysis to evaluate whether the proposed action is

contained within the viewshed. If the proposed project is within the viewshed, and likely to cause adverse impact, a BLM National Trail inventory and assessment is required, and should be broad enough to be able to identify reasonable alternative project locations with potentially less or no adverse impact. An area of potential adverse impact (APAI) is then delineated, encompassing the resources, qualities, values and associated settings and the primary use or uses identified. The BLM identifies the APAI, any adverse impacts on the nature and purposes; resources, qualities, values, and associated settings; and the primary use or uses for use in the affected environment, alternative formulation and analysis, and environmental consequences. The BLM considers alternatives which support National Trail purposes in accordance with the policy. The BLM also considers alternatives which direct the proposed project outside the APAI to a comparably disturbed or culturally modified area, such as areas already containing transmission lines, pipelines, highways, or improved roads.

In the B2H EIS, inventory and analysis for purposes of BLM Manual 6280 compliance were limited to the potentially affected segments of the Oregon NHT and Study Trails that are located on BLM-administered lands within the B2H Project area for the Draft EIS. Detailed inventory of these segments and analysis of impacts were presented in Appendix B.8 of the Draft EIS. For the Final EIS, an inventory baseline and analysis using BLM Manual 6280 concepts were applied across all lands using the Draft EIS Appendix B.8 to inform the analysis on BLM-administered lands.

The management standard includes additional direction for the environmental review process and in determining substantial interference and avoidance of incompatible activities. In compliance with Section 7(c) of the NTSA, through the NEPA processes for proposed actions on National Trails, the BLM may permit uses that will not substantially interfere with the nature and purposes of the National Trails, and to the extent practicable, the BLM shall make efforts to avoid activities that are incompatible with the purposes for which such trails were established. Subject to valid existing rights, the BLM may, through the appropriate NEPA analysis, approve, reject, deny, prohibit, minimize, and/or mitigate proposed actions.

As part of the NEPA analysis for the proposed action, the BLM will evaluate whether the proposed action would substantially interfere with or be incompatible with the nature and purposes of a National Trail (hinders or obstructs), and will consider the following.

For All National Trails

- The extent to which the proposed action would affect the BLM's ability to effectively manage the nature and purposes of the trail, trail resources, qualities, values, uses (including public access and enjoyment) and associated settings.
- The extent to which a proposed action would require a major relocation of the National Trail Management Corridor in order to provide for the conservation and enjoyment of the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, or the primary use or uses of the trail.

For National Historic Trails

- The extent to which the proposed action would affect the characteristics that made the trail worthy of designation.
- The extent to which the proposed action would affect the Federal Protection Components, including high potential historic sites or high potential route segments located on public land.

  The term "high potential historic sites" (NTSA Sec. 12) means those historic sites related to the route, or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use. Criteria for consideration as high potential sites include historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion.

  The term "high potential route segments" (NTSA Sec. 12) means those segments of a trail which would afford high-quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route.
- The extent to which the proposed action would affect designated National Historic Trail properties, including remnants and artifacts from the associated period of use that may be eligible or listed on the National Register and/or determined by the National Trail administering agency to qualify as possible high potential historic sites or high potential route segments.
- The extent to which the proposed action would limit the agency's ability to manage the trail for the purpose of identifying and protecting the historic route and its historic remnants and artifacts for public use and enjoyment, including interpretation, education, appreciation, and vicarious experiences.

As part of the NEPA analysis for a land-use plan that includes a National Trail(s) within the planning area, and for any implementation-level activities proposed along a National Trail or within a National Trail Management Corridor, the BLM shall:

- For each alternative, describe and analyze the potential impacts to the nature and purposes of the National Trail, and the National Trail resources, qualities, values, and associated settings and the primary use or uses of the trail.
- Describe the impacts to the national significance of National Trails, based on NHPA National Historic Landmark criteria and other NTSA criteria, as well as impacts to the significance of properties that are eligible or listed on the National Register, as applicable.
- Ensure adequate public involvement in the BLM's management activities through the NEPA, land-use planning, and/or other applicable processes.
- Coordinate with the National Trail administering agency during the environmental review and land-use planning processes, regarding the establishment of the National Trail Management Corridor.
- To the greatest extent possible, consider opportunities for mitigation to a level commensurate with the adverse impact on the nature and purposes; resources, qualities, values, and associated settings; and the primary use or uses of the National Trail.

Mitigation

Mitigation for congressionally designated trails means to eliminate or moderate, to the greatest extent possible, intensity and duration of the adverse impact on the nature and purposes; resources, qualities, values, and associated settings; and the primary use or uses of the National Trail from incompatible multiple-use activities.

- Mitigation includes rectifying, reducing, or eliminating the impact over time and/or compensating for the impact by replacing or providing substitute resources or environments.
- Onsite mitigation and design considerations can include moving the project location, minimizing the scale, camouflaging the proposed activity with visual screening techniques, or similar actions.
- Priority for mitigation should occur onsite first; secondly, in the general National Trail region; and lastly within the state (for multi-state National Trails) where the project is being proposed. Regardless of physical location, mitigation of project impacts must benefit the National Trail and should remain within the National Trail Management Corridor.
- Where onsite mitigation (along the National Trail) cannot adequately compensate for the adverse impact, off-site mitigation may include consideration of monetary compensation for public lands along the National Trail, and should be analyzed, incorporated, and carried out in accordance with all applicable laws and policies.
- The BLM shall monitor the conditions of National Trail resources, qualities, values, and associated settings and the primary use or uses of the trail on public lands or interests in lands; the effects of decision implementation; and in order to identify new and emerging issues.

Study Trails

BLM Manual 6280 Chapter 1.6 also provides the management standard for trails under study or recommended as suitable for congressional designation, and the BLM follows the Protocol for Proposed Actions which May Affect Trails Under National Trail Feasibility Study and Trails Recommended as Suitable for National Trail Designation (Chapter 2.4 of BLM Manual 6280).

The BLM shall consider management actions and alternatives that maintain the values, characteristics, and settings of trails under study and trails recommended as suitable, pursuant to FLPMA. In evaluating a proposed action on or along a trail under study or along a trail recommended as suitable, the BLM shall consider alternatives to the proposed action that avoid adverse impacts on the values, characteristics, and settings of such trails.

The protocol includes describing the values, characteristics, and settings of trails under study and trails recommended as suitable in the affected environment; analyzing and describing any impacts of the proposed action on the values, characteristics, and settings of trails under study or trails recommended as suitable; and considering an alternative that would avoid adverse impacts on the values, characteristics, and settings of the trail under study or recommended as suitable and/or incorporate and consider applying design features of the B2H Project for environmental protection to avoid adverse impacts.

The NPS currently is conducting a Feasibility Study/Environmental Assessment for additional alternate routes of the Oregon NHT under the NTSA, Public Law 90-543, as amended through Public Law 111-11, March 30, 2009 (NTSA).

Mitigation

Mitigation is applied to values, characteristics, and settings of trails under study and trails recommended as suitable under current BLM policy.

BUREAU OF LAND MANAGEMENT MANUALS 8400 AND 8431

BLM Manual 6280 directly references the BLM's Manual 8400, *Visual Resource Management*, in the process of completing the inventory of trails and Manual 8431, *Visual Resource Contrast Rating*, in any analysis of potential effect from proposed activities. The purpose of the BLM VRM system is to classify and manage visual resources on lands under its jurisdiction as outlined in BLM Manual 8400. The VRM system involves inventorying scenic values, establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether they conform to the management objectives (BLM 1984). In its planning process, the BLM weighs visual and competing resource values and designates VRM Classes I through IV, which represent a range of acceptable modifications within the landscape. The objective of VRM Class I is to preserve the existing character of the landscape whereas Class IV allows for major modifications.

The analysis stage of the VRM process involves assessing and disclosing the potential visual impacts from proposed activities (NEPA compliance) and then determining whether such impacts will meet the management objectives established for the area (plan conformance). To analyze and mitigate potential visual impacts associated with proposed activities, the BLM uses guidelines described in BLM Handbook H-8431. The degrees of visual contrast are categorized in a range including none, weak, moderate, or strong—where strong indicates that a proposed activity will create contrast that demands attention, will not be overlooked, and is dominant in the landscape. Factors to be considered when applying the contrast criteria include distance, angle of observation, the duration of the view of the project components, relative size or scale, and spatial relationships.

3.2.15.3 ISSUES IDENTIFIED FOR ANALYSIS

The following issues were identified for analysis during scoping efforts related to the B2H Project:

- What physical alterations to significant viewsheds associated with the Oregon NHT and other historic trails will occur?
- Will the B2H Project affect the Oregon Trail ACEC?

These issues are discussed further in the subsequent methods section as well as described by alternative in the affected environment and environmental consequences sections. Refer to Section 3.2.14 for effects on tribal interests.

3.2.15.4 Trail History

Oregon National Historic Trail

The network of pathways that became known as the Oregon NHT is actually a series of trail segments, river crossings, and landmarks that stretch across 1,932 miles (3,109 kilometers) to link the western frontier with the settled lands of the east (Lissandrello 1976). Many components of this historic trail network have been congressionally designated as NHTs and are part of the National Trails System. Interconnected with this transcontinental trail are regional and local historical stage and freight roads.

The principal route of western migration across southern Idaho into Oregon was the Oregon NHT. Originally established by Native American tribes, the route was refined by early European-American explorers and fur trappers, including members of the Astor Expedition of 1811 to 1812, and by Captain John C. Frémont in 1843. The first wave of migration came during the 1830s, as Protestant missionaries journeyed west to convert Native American populations (Hutchinson and Jones 1993). The first true immigrant wagon train arrived in southeastern Idaho in 1841, consisting of the Bidwell-Bartleson party. Thirty-four members of the Bidwell-Bartleson party and accompanying missionaries continued west along what would become the Oregon NHT. Shortly after the Bidwell-Bartleson party, Captain John C. Frémont explored the region as part of a federal expedition and published accounts that later became the trail guides for subsequent immigrants along the Oregon NHT (Hutchinson and Jones 1993). By the mid-1840s, the Oregon NHT was a major nationally recognized thoroughfare for immigrants making their way west.Portions of the Oregon NHT were used into the late 1890s, but the trail saw a decline once the Transcontinental Railroad—which provided faster, safer, and, usually, cheaper travel—was completed in 1869. One way that the Oregon NHT remained relevant in the days of the railroad were through the expansion of stage stops, which afforded the more flexible option for horse teams to be either exchanged or rested. One such important locale in the B2H Project area is the Slough House Stage Stop located approximately 8 miles north of Baker City. Built in 1865, the stage stop was located near the Oregon NHT at the intersection of the Road to Auburn (along the same alignment as I-84) and the Baldock Slough. The Slough House Stage Stop briefly was rivaled by another stop, the Ward Slough House, less than one mile to the north. The Ward Slough House predated the Slough House Stage Stop by at least one year, with its only documentation located on an 1864 surveyor's map. The Slough House Stage Stop ceased to be a stage stop by 1910 and was torn down in the late 1930s (Dielman 1999). Another landmark in the Baldock Slough vicinity was the Lone Tree (also referred to as Lone Pine), an infamous, solitary, and large pine tree along the Oregon NHT in Baker Valley. The tree was documented in numerous diaries and records of immigrants' journeys along the trail and served as an easy location to briefly rest and water animals in the slough before ascending the daunting Blue Mountains. Before the Lone Tree was chopped down for firewood on September 28, 1843, the Baldock Slough sometimes was referred to as the Lone Tree Creek in immigrant diaries. Long after the tree was cut down and burned for fuel, knowledge of it persisted with those along the Oregon NHT; several monuments and interpretive signs have been placed in dedication to the Lone Tree, which was likely located about 6 miles northeast of Baker City, where the Oregon Trail crossed the Powder River (Dielman 2013).

Numerous markers and memorials have been erected at burial sites, springs, immigrant camps, and inscription sites along these areas of the Oregon NHT. Several segments have been given discrete names, such as the California Gulch/Blue Mountain, Whiskey Creek, White Swan, Virtue Flat, Straw Ranch I and 2, Swayze Creek, Birch Creek, Tub Mountain, and Alkali Springs segments.

In the last 20 years, community interest and partnerships have led to the development, improvement, and rehabilitation of several recreation facilities and interpretive sites. The most notable of these developments are the construction of the NHOTIC in 1992 and the ongoing rehabilitation of its historic landscape (BLM 2004) on Flagstaff Hill and adjacent contributing trail segments, as well as improvements to parking facilities and interpretive signage at several Oregon NHT interpretive sites. Malheur and Baker counties have identified investments in tourism industries, attractions, and activities, particularly those related to the Oregon NHT, to further bolster the region's economy (BLM 2002).

Nature and Purpose

Management of the Oregon NHT and its associated resources is dictated through a Comprehensive Management and Use Plan (CMUP), which establishes coordinated action between federal, state, and private entities to provide for opportunities for use and interpretation along the various identified segments of the water, land, and associated motor routes. The Oregon Trail was designated as a NHT on November 10, 1978, and is administered by the NPS. Although neither the NTSA nor the CMUP developed for the Oregon Trail by the NPS specifically defines the "nature and purpose" of the Oregon NHT, the CMUP does describe the trail's "purpose and significance" (NPS 1999). According to the CMUP, the primary purposes of the Oregon NHT are "to identify, preserve, and interpret the sites, route, and history of the Oregon Trail for all people to experience and understand" and "to commemorate the westward movement of emigrants to the Oregon country as an important chapter of our national heritage" (NPS 1999).

The CMUP (NPS 1999) further states that the Oregon NHT is significant because:

- it was the first trail that demonstrated the feasibility of moving families, possessions, and cultures by wheeled vehicles across an area previously perceived as impassable;
- it was the corridor for one of the largest and longest emigration of families in the history of the United States;
- it is a symbol of American westward traditional migration embodied in traditional concepts of pioneer spirit, patriotism, and rugged individualism; and
- it strengthened the United States' claim to the Pacific Northwest.

Primary Uses

The Oregon NHT CMUP (NPS 1999) identifies a variety of recreational uses, including: interpretation; heritage tourism; media interest (which manifests itself in the production of movies and documentaries); walking; biking; horseback riding; historic reenactments of the trails experience, including handcart and covered-wagon expeditions; and commemorative activities, such as trail visitation, driving along auto

tour routes and BLM backcountry byways, reading interpretive brochures and publications, and visiting associated museums and educational facilities.

The primary uses of the Oregon NHT as defined in BLM RMPs are as follows:

- Baker RMP (BLM 1989): Sightseeing, historical interpretation, historic sightseeing, hiking, hunting, and interpretation
- Southeastern Oregon RMP (BLM 2002): Recreation management emphasizing public education and enjoyment of the Oregon NHT and its setting while protecting important cultural resource values, with specific management for semiprimitive motorized and roaded natural recreation
- Owyhee RMP (BLM 1999): Sightseeing, hiking, picnicking, and horseback riding

Visitors wishing to follow the Oregon NHT can do so through a number of means, such as hiking, biking, horseback riding, and driving along county roads and specially designated roadways. Many of the cross-country sections along the Oregon NHT provide recreational opportunities for motorized travel in a semiprimitive setting. Trail-related sites along the Old Oregon Trail Highway (U.S. Highway 30) and I-84 provide easy access to recreational opportunities. Interpretive sites can be accessed throughout the year, with most visitations occurring between June and October (NPS 1999).

As the Oregon NHT Auto Tour Route, I-84 provides opportunities for visitors to enjoy the trails year round. The auto tour route has been marked in accordance with the provisions of the NTSA and existing state DOT plans. The purpose of the auto tour route is to heighten public awareness of the trails and to stimulate interest in visiting actual trail sites, segments, and interpretive facilities. The route and NPS brochures guide visitors on a line of travel that parallels the designated route of the Oregon NHT to the extent possible, making it convenient for the public to locate designated trail sites and trail segments (NPS 1999).

The Oregon BLM has designated an ACEC consisting of 10 individual units to provide special management attention to protect the historic, cultural, and scenic values associated with the Oregon NHT. These discrete units of the ACEC include Echo Meadows, California Gulch, Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, Chimney Creek, Kenney Pass, Birch Creek, and Tub Mountain. High potential historic sites and high potential route segments, identified in the NPS Oregon NHT CMUP, located in proximity to the B2H Project are listed by alternative route in the following Affected Environment section.

LEWIS AND CLARK NATIONAL HISTORIC TRAIL

The approximately 3,700-mile-long Lewis and Clark NHT was designated to commemorate the route of the Corps of Discovery from Wood River, Illinois, to the mouth of the Columbia River, near what is now Astoria, Oregon (from 1804 to 1806). Commissioned by President Thomas Jefferson in part to survey newly acquired lands associated with the Louisiana Purchase, the Corps of Discovery also was charged with charting a navigable water transportation corridor through the continent. Led by Captain Meriwether Lewis and Second Lieutenant William Clark, the well-chronicled expedition was among the first to document Native American groups living along the Missouri and Columbia rivers, as well as the natural

resources in the area. Established in 1978 as one of the four original NHTs, the Lewis and Clark NHT represents a system of water- and land-based trails and auto tour routes that connect contemporary communities to the places associated with the expedition. The NHT also provides visitors with connections to the historical events associated with the Corps of Discovery through recreational, interpretive, and educational opportunities (NPS 2012).

The NPS designated a portion of U.S. Highway 730 and I-84 in the B2H Project area as the NHT's Auto Tour Route (motor route) as well as a segment of the Washington State Highway 14 north of the Columbia River. This portion in Washington is part of the Federal Highway Administration's National Scenic Byways Program, referred to as the Lewis and Clark Trail Scenic Byway, and is identified in the 1982 CMUP as part of the Columbia River Segment of the NHT (NPS 1982).

Nature and Purpose

The nature and purpose of the Lewis and Clark NHT, as articulated in the NPS foundation document are "to commemorate the 1804 to 1806 Lewis and Clark Expedition through the identification; protection; interpretation; public use and enjoyment; and preservation of historic, cultural, and natural resources associated with the expedition and its place in U.S. and tribal history" (NPS 2012). This document further establishes that the trail is nationally significant for:

- its commemoration of the 1804–1806 Corps of Discovery expedition;
- its ability to provide context for furthering the understanding of the expedition and its outcomes;
- its ability to connect contemporary communities and "demonstrate the continuum of human history…and subsequent relationships that developed among multiple cultures";
- its retention of "characteristics and a sense of place" similar to that which would have been experienced by the Corps of Discovery;
- its ability to educate the public about landscapes, resources, and people encountered and documented by the Corps of Discovery; and
- its diversity of landscapes, biological communities, and ecological zones.

Primary Uses

The primary uses of the Lewis and Clark NHT, as defined in the 1982 CMUP is to provide for public commemoration and interpretation of the historic events and "approximate retracement of the historic route" (NPS 1982). The CMUP acknowledges that many of the original features of the Corps of Discovery route have been altered by the damming and channelization of waterways, as well as by mining, farming, and urbanization. However, it also acknowledges that the Missouri and Columbia rivers offer the public the best opportunity for continuous "retracement" of the route. The 1982 CMUP recommended a series of sites, trail segments, and motor routes to facilitate recreational and interpretive connectivity between landmarks of the expedition including areas located adjacent to the B2H Project.

UPPER COLUMBIA RIVER ROUTE STUDY TRAIL

The Upper Columbia River Route Study Trail was one of the earlier, well-worn segments of the Oregon NHT, traveled most heavily between 1841 and 1851. The path of the Upper Columbia River Route Study Trail floated immigrants from the Hudson's Bay Company's Fort Nez Perce near Walla Walla, Washington, down the Columbia River to the Dalles. This route was traveled by the many parties who stopped at either the fort or the nearby Whitman Mission for supplies, rest, or medical assistance. This portion of the Columbia River was first traveled by Lewis and Clark with the Corps of Discovery in 1805, and then it was used regularly between Hudson Bay Company forts beginning in 1818 and then by missionaries in the 1830s. In 1836 Methodist missionaries Dr. Marcus and Narcissa Whitman traveled west via caravan, establishing several missions along the way before settling the Whitman Mission near present-day Walla Walla. The shore along the Columbia River also was walked, where the dangers of water passage were replaced by exhaustion in navigating the steep and rocky shoreline. As more routes were created across the Oregon NHT landscape, the Upper Columbia River Route Study Trail saw decreasing use, although the Columbia was still floated along other segments of the river (NPS 2015; Oregon Trails Coordinating Council 1998:167–176).

Nature and Purpose

The nature and purpose of the Upper Columbia River Route Study Trail has not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Upper Columbia River Route Study Trail is currently under feasibility study and does not yet have a CMUP, the trail's primary uses have not yet been identified.

UMATILLA RIVER ROUTE AND COLUMBIA RIVER TO THE DALLES STUDY TRAIL

Beginning in 1844, immigrants along the Oregon NHT began to shorten their route by circumventing the Whitman Mission and entering the Columbia River from the Umatilla River, saving several days of travel by using this new Umatilla River Route and Columbia River to The Dalles Study Trail. After the Incident at the Whitman Mission in 1847, the mission was closed entirely and many more immigrants took this shorter route. The Umatilla River Route and Columbia River to The Dalles Study Trail breaks away from the Oregon NHT at Echo, Oregon, where the trail ordinarily crossed the Umatilla River. From here, travelers would float the river to its junction with the Columbia River and proceed westward much as those did along the Upper Columbia River Route Study Trail, either by land or by water (NPS 2015; Oregon Trails Coordinating Council 1998:176–178).

Nature and Purpose

The nature and purpose of the Umatilla River Route and Columbia River to The Dalles Study Trail has not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Umatilla River Route and Columbia River to The Dalles Study Trail is currently under feasibility study and does not yet have a CMUP, the trail's primary uses have not yet been identified.

GOODALE'S CUTOFF STUDY TRAIL

The Goodale's Cutoff Study Trail (also known as the Goodale/Sparta Trail) is currently under feasibility study by the NPS as part of three alternate routes to be added to the Oregon NHT in Idaho and Oregon.

Goodale's Cutoff Study Trail is a 230-mile spur that began as a Native American trail and briefly was used as an alternate route to the Oregon NHT as early as 1820 by Donald Mackenzie in search of a trail for Canadian fur hunters to use (ISHS 1994, 1995). The main segment of the cutoff trail left the Oregon NHT at Fort Hall, Idaho, traveled northwest, then continued west near the modern alignment of U.S. Route 20 and through Camas Prairie, and rejoined the Oregon NHT between Mountain Home and Boise (ISHS 1972; McGill 2006a; NPS 2015, n.d.). Widespread use of the cutoff dates to 1862, when a party of more than 1,000 immigrants hired guide Tim Goodale to lead them from Fort Hall to Fort Boise. Goodale's Cutoff Study Trail quickly rose in popularity because it served to avoid military conflicts with the Shoshone-Bannock tribes, offered relatively unexploited grazing resources, and took settlers close or directly to the sites of several small gold rushes, including Salmon River and Boise Basin (Dary 2004; ISHS 1995; Wells 1972). The area's topography and volcanism caused those who took the cutoff to face many difficulties, including repeatedly needing to construct trail segments as they went along and coordinating with other local businessmen, including John Brownlee and other ferrymen along the Snake River (ISHS 1972, 1994).

An additional small northern segment, Goodale's Boise-North Route was newly blazed by Goodale. The route began west of Boise Basin and proceeded north to the Brownlee Ferry crossing of the Snake River then followed a westward alignment to Richland, crossed the Powder River, followed a southern alignment, and continued along the creek to Flagstaff Hill near Baker City, Oregon (ISHS 1972, 1994; McGill 2006b; NPS 2015). This generally "zigzag road," traversing the steep inclines of several the river banks, was an alternative purportedly used by prospectors, including prospector George Grimes, who used the route to travel between the Boise Basin mines and Walla Walla (McGill 2006c; Wells 1972). By 1864 guides were no longer necessary through the land surrounding the cutoff because the area had become so well developed (ISHS 1972; 1994; NPS n.d.).

Nature and Purpose

The nature and purpose of the Goodale's Cutoff Study Trail have not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Goodale's Cutoff Study Trail is currently under feasibility study and does not yet have a CMP, its primary uses have not yet been identified.

OLDS FERRY ROAD STUDY TRAIL

One relatively small connecting trail is the Olds Ferry Road Study Trail, which was created for the express purpose of bringing immigrants to the Olds Ferry. The Olds Ferry Road Study Trail begins along Goodale's Boise-North Route Study Trail alternate along the Payette River, southeast of Weiser, Idaho along the Snake River. The trail proceeds through what is today Weiser, turns and makes a straight path northwest for Eaton, Idaho, and then follows closely along the north bank of the Snake River to Farewell Bend, the location of Olds Ferry. The main route of the Oregon NHT is located immediately on the Oregon-side of the Snake River in this location (NPS 2015). Olds Ferry began operation in 1863 and was operated by Ruben Olds under the Oregon Road, Bridge, and Ferry Company. The ferry and the trail remained operational at this location until 1920 when the ferry was purchased and moved down the river to Brownlee (ISHS 1982a, 1982b; Query 2008:40).

Nature and Purpose

The nature and purpose of the Olds Ferry Road Study Trail has not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Olds Ferry Road Study Trail is currently under feasibility study and does not yet have a CMUP, the trail's primary uses have not yet been identified.

MEEK CUTOFF STUDY TRAIL

The NPS is conducting a feasibility study to add the Meek Cutoff to the Oregon NHT. The Meek Cutoff has been recognized by the Oregon State Legislature as one of five alternate routes of the historic alignment of the Oregon Trail that pass through Oregon (NPS 1998).

The Meek Cutoff Study Trail, blazed as an alternate, fractured route of the Oregon NHT in 1845, traveled west from the Oregon NHT's junction with the Malheur River in Vale. Stephen Meek, accompanied by approximately 1,000 immigrants, 200 wagons, and 4,000 heads of livestock, set out convinced that they could connect an overland route through central Oregon and into the Willamette Valley, saving roughly 150 miles of travel and avoiding potential conflict with Native American groups. Meek led the wagon train along the rocky banks of the Malheur River and over steep rocky bluffs, with the wagons and immigrants experiencing a difficult time along the route (Beckham 1991; Clark and Tiller 1966; Jackman and Scharff 1996:18; Lang 2016).

Water and forage for draft animals became scarce along the journey and many of the immigrants felt that Meek had misled them. Emotions reached a fever pitch when the group became stalled at Lost Hollow, with no water found within miles (Clark and Tiller 1966:48; Montgomery 1992:260). The wagon train split just south of the Maury Mountains near Lost Hollow, with one small group traveling northwest in search of the Deschutes River and the other larger group traveling more north toward the Crooked River. The two groups arrived separately at Sagebrush Springs, near Gateway, Oregon. Meek and the remaining immigrants reached The Dalles, having lost at least 23 members to disease and hunger

along the way, with an estimated 25 more people dying after reaching The Dalles (Clark and Tiller 1966:62–119; Oregon Trails Coordinating Council 1998:199–213). Slight variations along this route are present, exemplified in two of the three routes undergoing analysis in the Four Trails Feasibility Study (NPS 2015). The two routes relevant to the B2H Project are the Ragen and Hambleton routes, named for the authors of their respective researched alignments (Hambleton and Hambleton 2014; Ragen 2013).

Nature and Purpose

The nature and purpose of the Meek Cutoff Study Trail have not yet been defined, as the trail is currently under feasibility study.

Primary Uses

As the Meek Cutoff Study Trail is currently under feasibility study and does not yet have a CMUP, its primary uses have not yet been identified.

BLM MANAGEMENT PLANS

In addition to planning direction from the NPS, the BLM has identified management direction in resource plans associated with the Oregon NHT. The following language is referenced from those resource plans.

Vale District Resource Management Plan

Oregon Trail Area of Critical Environmental Concern

- Seven parcels of public lands with remnants of the Oregon National Historic Trail (1,495 acres) are designated and will be managed as an ACEC to preserve the unique historic resources and visual qualities of these areas.
- New uses incompatible with maintaining visual qualities or providing public interpretation will be excluded in a 0.5-mile corridor.
- Rights-of-way will avoid the Oregon Trail.
- No new road access will be developed. Off-road vehicle use will be limited to designated roads and trails.
- Adjacent lands, or lands in the Oregon Trail geographic unit, may be acquired to protect intact segments of the Oregon National Historic Trail; these lands would be incorporated into the ACEC, and the same special management prescriptions or restrictions will be applied.

Vale District Oregon National Historic Trail Management Plan

Rights-of-Way, Realty Uses, and Land Tenure

Right-of-way crossings should be made in areas of previous disturbance or at right angles to Oregon Trail remnants, when possible. Stipulations will be developed in consultation between the project Applicant and BLM to determine exactly where and how the right-of-way will cross the corridors, and to establish rehabilitation procedures. Within protective corridors, install new utilities in areas as

unobtrusive as possible, and rehabilitate the surface to a natural contour. All crossings to avoid fragile trail remains, and will avoid placing new utilities within 200 feet of unmodified Oregon Trail remnants.

Vegetative Manipulations

All vegetative manipulations or rehabilitations within the protective corridor should be planned and conducted so that the finished product resembles natural vegetation composition and patterns.

Owyhee Resource Management Plan

Manage the Oregon National Historic Trail in accordance with the Oregon Trail CMUP and Oregon Trail Management Plan, or as may be amended.

U.S. Forest Service Management Plans

In addition to planning direction from the NPS, the USFS has identified management direction in resource plans associated with the Oregon NHT. The following language is referenced from those resource plans.

Wallowa-Whitman National Forest Land and Resource Management Plan

The Blue Mountain Segment of the trail is 16 miles in length, of which 6 miles are on national forest lands with the remainder being on private lands. This segment contains some of the best remaining examples of intact trail. The USFS is the lead agency for managing this segment and has developed a management plan to assure that its historic value is preserved.

Management Plan for the Blue Mountain Segment of the Oregon Trail

Management Decisions

1. Preservation of remnants of the Oregon Trail and Blue Mountain Segment for public use.
2. Maintenance of scenic corridors with an average total width of 0.5 mile along remnants of the historic trail. This scenic corridor is to be classified as “Foreground,” variety class “A” sensitivity level “one,” with VQO of retention under the visual management system.
3. Designate scenic corridors along trail remnants as “limited” to off-road vehicle use. Motor vehicle use will be allowed only on designated routes.
4. Integration of private and public holding utilizing any or all of the following measures:

    a. Development of cooperative agreements with the private landholders;
    b. Acquire the private landholdings through land exchanges or other means;
    c. Acquire cultural resource or scenic easements from the private landholders.

5. Development of cooperative agreements with the BLM for the Echo Summit section of the Oregon Trail and other BLM holdings.

Management Intent

1. The Visual Corridor: Manage lands within the visual corridor along either side of the remnants of the Oregon Trail, the Blue Mountain Segment, so as to minimize surface-disturbing activities.

The Visual Corridor is the physical setting for the Oregon Trail segments. The width of the corridor will extend approximately 0.25 mile to either side of the historic trail ruts.

2. The Oregon Trail Segments: Manage the cultural resources within the framework of total protection. Management strategies should work to prevent any adverse effects from impinging on the Cultural Resources. The Oregon Trail segments include the actual trail ruts, sacred trees, campgrounds, and other remnants of cultural activity associated with the trail, as well as the land within 200 feet in all directions of these cultural resources.

Land Management

The Visual Corridor

1. If pipelines, power lines, roads, or fences must be constructed across the historic trail routes, install in areas as unobtrusive as possible and across existing, already disturbed portions of trail routes and corridors, and utilize visual design techniques to minimize visual impacts.
2. All special-use authorizations must consider the visual impacts of any authorized undertaking and prohibit visual degradation within the corridor.

The Oregon Trail Segments

1. Pipelines, power lines, roads, or fences may not be constructed across the trail segments.
2. If they must run near a trail segment, install in areas as unobtrusive as possible and choose already disturbed portions of trail routes and corridors for the crossing. Utilize visual design techniques to minimize visual impacts and keep at least 200 feet away from trail segment(s). All special-use authorizations must consider the visual impacts of any authorized undertaking and prohibit visual degradation within this 200-foot zone.

COUNTY PLANNING DIRECTION

In addition to planning direction from the NPS, Baker County has identified planning direction in their zoning ordinance associated with the Oregon NHT. The following language is referenced from those ordinances.

Baker County Zoning Ordinance

Chapter 650—National Historic Oregon Trail Interpretive Center Overlay Zone

650.01 Purpose. The purpose of the NHOTIC Overlay Zone is to establish a review process for land-use actions within the Interpretive Center viewshed overlay. The review process is to allow the BLM to comment on proposed land-use actions prior to establishing the use.

650.02 Definition. The NHOTIC viewshed is a visual resource. The overlay is meant to retain the historical character of the landscape and is identified on the NHOTIC Overlay Zone viewshed map at the Baker County Planning Department.

650.03 Requirements. The Baker County Planning Department shall provide notification and opportunity to the BLM to comment on land-use actions occurring within the viewshed, on

determination of a complete application as described in Section 205.10. The BLM shall review the proposed action and respond with an outline of concerns, if any, to the planning department. If the BLM does not respond within 20 days of receiving the notice, it will be determined, by the planning department, that there are no concerns with the proposed land-use action.

Chapter 710 – Historic, Cultural, and Natural Resources

710.03 (B) (3). For Resources on Federally Managed Lands: The findings and conclusions of Baker County relative to a proposed alteration or demolition of a significant cultural/historic/natural site/structure shall be forwarded to the appropriate federal agency as a recommendation.

710.03 (B) (4). For Resources Not Inventoried or Designated as 1B: For resources of unknown significance or resources not on the inventory, a local review will be conducted by BLM and USFS personnel, the ODFW, state and/or college historians, and local museum and historical society members to evaluate the resource's comparative worth and make a recommendation as to whether a full public hearing is warranted.

3.2.15.5 Methods

Introduction

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.3 and Section 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on national historic trails.

As identified in Section 3.2.15.2, BLM Manual 6280 requires that potential impacts associated with proposed actions are disclosed with respect to NHTs and Study Trails on BLM-managed lands. Additionally to compare different alternatives, regardless of jurisdiction, a common level of analysis needs to be conducted across all lands as required by NEPA. In general terms, the programmatic policy associated with BLM Manual 6280 suggests that the evaluation of potential impacts should consider whether a proposed action would:

- "affect the BLM's ability to effectively manage the nature and purposes of the trail, trail resources, qualities, values, uses, and associated settings"
- "require a major relocation of the National Trail Management Corridor"
- "affect the characteristics that made the trail worthy of designation"
- "affect the Federal Protection Components, including high potential historic sites or high potential route segments"
- "affect designated NHT properties, including remnants and artifacts from the associated period of use that may be eligible or listed on the National Register"
- "limit the agency's ability to manage the trail for the purpose of identifying and protecting the historic route and its historic remnants and artifacts for public use and enjoyment, including interpretation, education, appreciation, and vicarious experiences"

More specifically, BLM Manual 6280 provides separate guidance regarding the analysis of both NHTs and Study Trails. Analysis of potential impacts on NHTs includes the following considerations—some of

which are specifically required when a National Trail Management Corridor has not yet been established (as is the case with the Oregon and Lewis and Clark NHTs):

- Determination of whether the proposed action is consistent with the purpose for which the trail was designated, as well as a determination of whether the proposed action would "substantially interfere" with the nature and purposes of the trail;
- Completion of a viewshed analysis to evaluate whether the proposed action is within the viewshed;
- If the proposed action is likely to cause adverse impact, completion of a BLM National Trail inventory and assessment and identification of alternative locations with less or no adverse impact; and
- Identification of any adverse impacts on the nature and purposes, resources, qualities, values, associated settings, and primary use or uses of the trails.

Analysis of potential impacts on Study Trails includes the following considerations:

- "describe the values, characteristics, and settings of trails"
- "analyze and describe any impacts of the proposed action on the values, characteristics, and settings of trails"
- "consider an alternative that would avoid adverse impacts to the values, characteristics, and settings of the trail"

In order to comply with the requirements and guidance provided in BLM Manual 6280, an inventory and analysis of potential impacts was completed for the trails located on lands managed by the BLM from which the B2H Project components would be visible. The trails that are on BLM-administered lands are the Oregon NHT, Goodale's Cutoff, Meeks Cutoff, and Olds Ferry Road Study Trails. The portions of the Lewis and Clark NHT, Upper Columbia River Route, and Umatilla River Route and Columbia River to The Dalles Study Trails within the B2H Project area are not located on BLM-administered lands. The inventory and analysis provides the necessary information and data to satisfy the considerations listed above. The inventory and analysis covers portions of the Oregon NHT, Goodale's Cutoff, and Meeks Cutoff Study Trails on BLM-administered lands and is included as Appendix B.8 in the Draft EIS. In addition to this detailed inventory of trail resources on BLM-administered lands, best available data were used to inventory trail resources on all lands in a consistent manner for the Final EIS.

Impacts on the Oregon NHT, Lewis and Clark NHT, and Study Trails were assessed in terms of the potential effects on four trail-related resource categories: trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources. An introduction to the methods of analysis associated with the trail-related resources is presented below.

Trail Management

According to BLM Manual 6280, the NHT analysis must identify "any adverse impacts on the nature and purposes" and "primary use or uses" of the NHT. This requirement does not apply to Study Trails

because they do not have an established nature and purpose or primary uses. For the assessment of impacts on the nature and purpose and primary uses of the Oregon and Lewis and Clark NHTs, the level of impact on trail-related resources was referenced but was not a direct translation of these effects into a quantification of impacts on trail management. Due to the intricate nature of trail management guidelines, a narrative discussion of impacts is presented by alternative to present the effects the B2H Project would have on the long-term management of the trails and their resources In general, high impacts on trail resources represent a finding of substantial interference with the nature and purposes of the trail. These impacts would vary for the alternatives based on the four identified trail-related resource categories (i.e., trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources).

In addition to identifying impacts on the NHT nature and purpose, the analysis considered impacts of the B2H Project on BLM, USFS, and local county planning direction to assess compliance with those plans as well as opportunities to mitigate impacts on conform to the planning environment on both public and private lands with trail resources.

The analysis included disclosure of potential impacts from the No Action Alternative. Under the No Action Alternative, the agencies would not issue a permit for the construction or operation of the B2H Project on federally managed lands. The No Action Alternative would result in no direct or indirect B2H Project-related impacts on identified NHT or Study Trail resources. Other effects associated with continued access, recreation, and similar actions would continue at the current rate and would be the responsibility of the land-managing agencies.

Visual and Recreation Resources

In broad terms, impacts on visual resources refer to the change in aesthetic values resulting from modifications to the landscape. Because BLM Manual 6280 does not specifically identify methods for evaluation of impacts on visual resources related to the viewshed of the identified trail segments, the methods for evaluating visual impacts in this assessment were based on the general concepts of visual contrast evaluation as outlined in BLM Handbook H-8431-1, Visual Resource Contrast Rating (BLM 1986a). Due to the linear nature of the B2H Project and some NHT viewing locations, using BLM contrast-rating worksheets from static locations would not fully represent or depict impacts on these trail resources. Analysis contained in the Draft EIS, which was focused on using both KOPs in the visual resource and NHT sections to determine impacts, was expanded to include impacts from trail-associated recreation sites (e.g., NHOTIC, other interpretive sites, state recreation areas, etc.), contributing trail resources (i.e., contributing trail segments and associated sites), NPS-identified high potential historic sites, and the NPS auto tour route. References to these visual resource and NHT-associated KOPs are made as they apply to the more detailed inventory components to provide consistency between the Draft and Final EIS documents, including any associated inventory observation points from the aforementioned Draft EIS Appendix B.8. Additionally, it is noted where trail resources are located within NHT-associated specially designated areas (e.g., ACECs and SRMAs).

The visual resource analysis for NHTs also includes the effect of the B2H Project on trail-related scenery in the context of modern interpretation of the trail. This interpretation differs from the description of trail setting described in Section 3.2.15.5, which focuses on the historic intactness of the setting. For example, views from the NHOTIC include the community of Baker City and adjacent agricultural lands. From a historic standpoint, these would be seen as modifications to the setting; whereas, for modern-day recreation viewers, these elements are to be expected in the viewshed. For the final component associated with visual and recreation resources, the assessment of compliance with VRM Class Objectives, refer to Section 3.2.12. Many of the KOPs in the visual resources analysis are associated with NHTs, such as the NHOTIC, which are used to describe effects on views, as well as compliance with VRM Class Objectives. To avoid mixing the visual resource and NHT programs, only the effects on views from these locations are included in this section. The determination of compliance with VRM Class Objectives and conformance with BLM RMPs is described in Section 3.2.12.

Historic and Cultural Resources

To evaluate potential impacts on the qualities and values of the Oregon NHT, cultural resource studies completed for the B2H Project were consulted to determine the condition, NRHP eligibility, and character-defining features of the trail segments and their associated historic and cultural resources. These findings were then compared with observations made during the field inventory to determine what impacts, if any, the B2H Project would have on NRHP-listed sites, contributing trail segments, and historic and cultural resources located within the B2H Project area.

Historic and cultural resources were evaluated according to the impact thresholds provided in Table 3-452. These thresholds are based on the alteration of character-defining features, the diminishment to aspects of NRHP integrity (i.e., location, design, setting, materials, workmanship, feeling, and association), and whether the degree of alteration would constitute an adverse effect that would or would not be amenable to minimization or mitigation.

The field assessment associated with the draft NHT inventory report (Draft EIS, Appendix B.8) did not include comprehensive physical documentation of trail resources. Impacts on trail segments in the Final EIS were assessed using best available data acquired from the BLM to determine those segments of the trail contributing to its eligibility. Additionally since many BLM specially designated areas (e.g., ACECs and SRMAs) are associated with these trail resources, those areas are referenced as appropriate to provide context for those historic sites and trail segments.

The analysis of historic and cultural settings is dependent on both the existing historic character of the landscape and the degree to which the historic character would be affected by the B2H Project. Based on observations made during the field inventory, the historic setting of each trail segment on BLM-administered lands was categorized in the draft NHT inventory report as either retained or diminished. Due to the alternative route adjustments and additional routing variations made since the publication of the Draft EIS and the expanded analysis to cover all land jurisdictions (per BLM Manual 6280), the determination of existing historic character of the landscape was supplemented by comparing the

presence of existing utilities and other cultural modifications using the concept of visual contrast, which is further described in the Methods subsection.

Biological, Natural, and Other Resources

The final components for trail analysis, as outlined in BLM Manual 6280, are biological, natural, and other resource elements beyond trail management, visual and recreation resources, and cultural and historic resources. Due to the interconnected nature of many of these trail resources, there is some overlap between biological resources, historic and cultural settings, and visual resources. The focus of this portion of the assessment is on the effect the B2H Project would have on characteristic vegetation communities and water sources (e.g., springs, rivers, etc.), which shaped the experience of those using the NHTs during the trails' periods of significance.

DATA SOURCES

A range of data sources was used to inventory and assess NHTs and Study Trails, including those sources associated with trail management; visual and recreation resources; cultural and historic resources; and biological, natural, and other resources. Some of the data used to depict each of these trail components overlap, such as the NPS-designated auto tour route, which is part of the trail protection components identified by the NPS for trail management and is a viewing platform for trail recreation experiences.

Trail management data were acquired from the NPS, including data associated with NPS-prepared comprehensive management plans and trail feasibility studies for Study Trails. These data include (1) congressionally designated trail alignments (continuous alignments), (2) high potential route segments, (3) high potential historic sites, (4) auto tour routes, and (5) for Study Trails, the alignment being studied for designation.

Visual and recreation resource data include those data depicting the existing setting, as well as locations where vicarious or recreation experiences associated with NHTs could occur. Due to the planning-scale data associated with the BLM VRI, compared to the scale of the B2H Project and its preparation focused on visual resources specifically, this data set was not used directly in the analysis. Instead, the B2H Project-associated Visual Analysis Units (VAUs) were used at a high level to define the types of scenery and settings crossed by the Applicant's Proposed Action Alternative and the alternative routes and route variations. Recreation data were acquired from the BLM and NPS, including trail-associated interpretive sites and the designated auto tour route. Additional data, including trail segments and associated cultural resource sites, were used in the analysis of impacts on setting but are discussed in the Section 3.2.13.5.

The cornerstone of the analysis of effects on the NHTs is the contributing trail segments and high potential historic sites (also part of the trail protection components), as well as trail-associated cultural resource sites, which form the basis for the assessment of impacts on historic and cultural resources, including setting. These data were acquired from the Oregon SHPO, BLM, NPS, and the Navy and represent the best available dataset for those elements contributing to the NRHP listing of these historic

trails. It is important to note these data were not available for the Study Trails analyzed. Class III cultural resources inventory will be completed for the selected route (as described in Section 3.2.13). At that time all trail segments and associated sites encountered during the Class III inventory of the selected route will be documented in compliance with the requirements of Section 106 of the NHPA.

Finally, the relevant biological, natural, and other resources are mostly associated with the broad-scale vegetation communities and riparian corridors (as described in the VAUs; refer to Section 3.2.12) as well as springs and other water sources identified in the trail-associated cultural resource sites described in the above paragraph.

Analysis Area

Each NHT and Study Trail has a study corridor that is defined as the area within 5 miles of the trail congressional alignment (for NHTs) or feasibility study alignment (for Study Trails) and the area within 5 miles of the B2H Project alternatives and route variations.

Visibility Analysis and Distance

Two different viewshed analyses were conducted for the analysis to assess (1) visibility of the B2H Project from viewing platforms associated with visual, recreation, and cultural resources and (2) the extent of B2H Project visibility along linear viewing platforms (e.g., contributing trail traces and NPS-designated auto tour routes). These viewshed analyses were developed using GIS-based "bare-earth" viewsheds, which are based on a digital elevation model and, therefore, reflect visible areas of the landscape based on existing landforms, without consideration of vegetation or built environment. Because availability of data regarding existing vegetation and built environment are limited, the bare-earth analysis makes the best use of available GIS digital elevation model data and also provides a worst-case scenario for visibility.

Impact Assessment and Mitigation Planning

Criteria for Assessing Level of Impacts

The amount of visual contrast, level of dominance, and level of attraction introduced by B2H Project components would have an effect on views from the Oregon and Lewis and Clark NHTs and the Study Trails (also referred to as the trails' viewsheds). For this project-level analysis, the factors that were used to evaluate the changes to the viewsheds included the scale and spatial relationship and the duration of view of the Applicant's Proposed Action Alternative and the alternatives and route variations in relation to the trails.

Scale and spatial relationship evaluate the degree of prominence or contrast of the B2H Project components in relation to the surrounding landscape when viewed from the trails. Scale refers to the size of B2H Project components relative to the features in the landscape. The larger B2H Project components appear, the less they would repeat the common elements and patterns in the surrounding landscape; that is, the B2H Project components would appear to dominate the landscape. In addition to scale, the arrangement, known as the spatial relationship, of landscape features also can affect the visual prominence of B2H Project components from sensitive viewing platforms. Consideration of the

amount of visual contrast created is directly related to the amount of attention that is drawn to an element in the landscape. For this analysis, the contrast is assessed by comparing the alternative routes and the associated facilities with the major features within the existing setting of the trails (refer to B2H Project Contrast in the Methods subsection).

The duration of view refers to how long (in miles) the B2H Project components would be seen from the trail. Duration of view is used to quantify the magnitude of potential impacts on the views from the trail. For example, B2H Project components may dominate the setting adjacent to the trail, but whether the components can be seen for 1 mile or 10 miles along the trail would help better understand the magnitude of the potential impacts. The specific methods to quantify the duration of views are described in the Methods subsection.

Table 3-452 defines the criteria used to determine high, moderate, and low impacts on NHTs and Study Trails associated with components of trail management; visual and recreation resources; historic and cultural resources; and biological, natural, and other resources. Note that the Draft EIS included a negligible impact category; however, in the Final EIS, this category was merged with low impacts to be consistent with other resource analyses.

Table 3-452. Criteria for Assessing Level of Impacts on National Historic Trails and Trails Under Feasibility Study

Level of Impacts	Description
High	• Trail Management – Construction and operation of the Boardman to Hemingway Transmission Project (B2H Project) substantially would interfere with, or be incompatible with, the intended experience of the trail, as expressed in the trail's nature and purpose and primary uses. The B2H Project would adversely affect the characteristics and components[1] that supported the trail's designation and the agency's ability to manage the trail for the trail's designated purposes. Impacts would not be able to be effectively mitigated requiring additional compensatory mitigation
	• Visual and Recreation Resources – Contrast produced by the B2H Project would demand attention and dominate views (e.g., views of skylined structures would be unobstructed) from the trail components where form, line, color, and texture of B2H Project components would be incongruent with existing landscape or historic features. The B2H Project would be highly visible and views of the B2H Project would be long in duration. – B2H Project components would visually dominate high-quality, diverse, and rare or unique scenery where the setting is a defining factor for the high potential route segments or as seen from historic properties and/or interpretive areas. – Intact resource values, including recreation and National Trail-related travel management opportunities and values would be substantially compromised by the B2H Project. These values would no longer contribute to the character of the trail.
	• Historic and Cultural Resources – Characteristics and setting of trail-associated historic properties located in the trail corridor and trail segments would be severely modified to the extent that the characteristics and setting no longer would contribute to the National Register of Historic Places eligibility of the trail. Impacts could include direct impacts on historic properties and visual impacts on the setting of historic properties.

Table 3-452. Criteria for Assessing Level of Impacts on National Historic Trails and Trails Under Feasibility Study

Level of Impacts	Description
High	• Biological, Natural, and Other Resources – Natural values, including any key contributing values and characteristics, would be substantially compromised by the B2H Project (i.e., a riparian area adjacent to a route segment follows what would be cleared for access roads) to the extent that these values no longer would contribute to the character of the trail.
Moderate	• Trail Management – Construction and operation of the B2H Project would somewhat interfere with, or be incompatible with, the intended experience of the trail, as expressed in the trail's nature and purpose. The B2H Project would affect the characteristics and components[1] that supported the trail's designation and the agency's ability to manage the trail for the trail's designated purposes. Agency-required mitigation measures would be required, and would be effective."
	• Visual and Recreation Resources – Contrast produced by the B2H Project would attract attention from the trail components (e.g., views would be partially screened or backdropped), and B2H Project components would be codominant with existing landscape features. The B2H Project would be prominent and views of the B2H Project would be moderate in duration. – The inherent quality of interesting, but not outstanding, landscapes would be modified through the introduction of elements not common in the landscape, as seen from historic properties and/or interpretive areas. – Intact resource values, including recreation and National Trail-related travel management opportunities and values, would be modified by the B2H Project but would remain suitably intact and continue to contribute to the character of the trail.
	• Historic and Cultural Resources – Characteristics and setting of trail-associated historic properties located in trail corridors or seen from trail segments would be modified to the extent that the characteristics and setting may no longer contribute to the National Register of Historic Places eligibility of the trail, although the effects on these sites could be minimized. No direct impacts on historic properties would occur; however, visual impacts on the settings of historic properties would occur.
	• Biological, Natural, and Other Resources – Natural values, including any key contributing values and characteristics, would be modified by the B2H Project but would remain suitably intact and continue to contribute to the character of the trail.
Low	• Trail Management – Construction and operation of the B2H Project would not interfere with, or be incompatible with, the intended experience of the trail, as expressed in the trail's nature and purpose. The B2H Project would not adversely affect the characteristics and components[1] that supported the trail's designation or the agency's ability to manage the trail for the designated purposes. Agency-required mitigation measures would be required, and would be effective.

Table 3-452. Criteria for Assessing Level of Impacts on National Historic Trails and Trails Under Feasibility Study	
Level of Impacts	**Description**
Low	• Visual and Recreation Resources – Contrast produced by the B2H Project would not be readily apparent (e.g., views would be partially to completely screened or backdropped) from trail components and would be subordinate in the context of existing conditions. The B2H Project would be visually subordinate and views of the B2H Project would be short in duration. – Minimal change would occur to the existing character of interesting and common landscapes as seen from historic properties or interpretive areas. – Intact resource values, including recreation and National Trail-related travel management opportunities and values, would be modified minimally by the B2H Project. Contributing values would continue to define the character of the trail.
	• Historic and Cultural Resources – Characteristics and setting of trail-associated historic properties located in the trail corridor and trail segments affected would be modified, but their ability to contribute to the National Register of Historic Places eligibility of the trail would not likely be affected. No direct impacts on historic properties would occur, and visual impacts on the settings of historic properties would be minimal.
	• Biological, Natural, and Other Resources – Natural values, including any key contributing values and characteristics, would be modified negligibly by the B2H Project. Contributing values would continue to define the character of the trail.
Table Note: For designated NHTs: Federal protection components, including high potential historic sites and route segments; national significance; and National Trail characteristics. For trails under study this includes the values, characteristics, and settings of trails under study	

Effects Analysis

To determine the effects on NHTs from the B2H Project, both qualitative and quantitative analyses were conducted for the Applicant's Proposed Action Alternative and the alternative routes and route variations to assess impacts on the four trail-related resource categories (i.e., trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources). For impacts on visual and recreation resources and historic and cultural resources, expanded quantitative analysis was conducted to further refine the analysis presented in the Draft EIS. The anticipated effects on the trail's nature and purpose and primary uses are analyzed qualitatively.

Assessment of Initial Impacts

As described in the Data Sources subsection (Section 3.2.15.5), a wide variety of locational trail data was combined for analysis of direct effects (i.e., effects on contributing trail segments or sites) and indirect effects (i.e., effects on views or setting from affected contributing trail segments or sites) on NHTs. For designated NHTs, the impact assessment includes effects on high potential historic sites, trail-associated cultural resource sites, contributing trail segments, designated auto tour routes, and trail-associated recreation sites. Note that high potential route segments are not included in this portion of the assessment (rather, they are included in the analysis of effects on trail management) because the best available data for high-quality trail segments are those segments identified as contributing to

the eligibility of the NHT. For Study Trails, the analysis focuses on the feasibility trail alignments acquired from the NPS.

For assessment of direct effects, the level of initial impacts is applied as defined in Table 2-7. To assess indirect impacts, views from trail resources, B2H Project-specific distance zones were developed using GIS offset analysis from these elements to delineate proximity zones from the Applicant's Proposed Action Alternative and the alternative routes and route variations. In the Draft EIS, the B2H Project-specific distance zones were defined as foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles), which is consistent with BLM Visual Resource Manual 8410-1. In the Final EIS, the middleground distance zone is further subdivided into finer proximity zones: from 0.5 to 1 mile; from 1 mile to 2 miles; from 2 to 3 miles, and from 3 to 5 miles. The additional middleground proximity zones allow for a gradation of impacts where the B2H Project would be viewed at increasing distances from these trail resources within the middleground distance zone. Additionally, as described in Section 3.2.12, the concept of B2H Project contrast was developed based on (1) the extent of B2H Project disturbance created by the construction of access roads and vegetation clearing and (2) the proximity of existing structural elements in the landscape that are similar to those structural components associated with the B2H Project (transmission line towers). By identifying the areas where the B2H Project would contrast greater with the existing landscape setting, such as steep forested slopes with no existing transmission lines present, a baseline for the level of visual contrast the B2H Project would introduce is assessed. In context with the proximity to trail resources, the level of indirect effects created by the B2H Project on views from trail-associated viewing locations is assessed through GIS analyses in a consistent manner across the entire B2H Project, regardless of jurisdiction. The results of the automated GIS analysis have been refined through GIS viewshed modeling and have been compared to field observations and conclusions made in the Draft EIS Appendix B.8 to refine the analysis and provide continuity with the analysis in the Draft EIS, as well as considering the visual contrast elements defined in BLM Manual 8431. The results are discussed in the environmental consequences section.

Mitigation Planning and Effectiveness

In order to reduce impacts on NHTs and Study Trails, a comprehensive approach to mitigation planning was developed for the B2H Project, beginning with the siting of the B2H Project alternatives and route variations to minimize impacts on NHTs and Study Trails (avoidance) while considering other resource concerns such as Greater Sage-Grouse habitat. Impacts resulting from the siting of alternatives and route variations were then reduced to the extent possible using design features of the B2H Project for environmental protection (initial B2H Project design), selective mitigation measures (site-specific design based on resource impacts), and compensatory mitigation. B2H Project design features and selective mitigation measures include project-associated BMPs from Appendix 1 of BLM Manual 6280. These BMPs include measures to safeguard the nature and purposes of the Oregon NHT and Lewis and Clark NHT, including NHT-related resources, qualities, values, and associated settings, and the primary use or uses of NHT as well as potential designation of Study Trails. Through the assessment of initial B2H Project impacts, the design features of the B2H Project for environmental protection (Table 2-7) were included in the design of the B2H Project and were applied project wide. Selective mitigation

measures (Table 2-13) were considered on a site-specific basis and to further reduce effects, the mitigation measures were based on the level of initial impacts and were applied where appropriate and feasible. For NHTs, 10 selective mitigation measures, which are described in this section, were proposed for the B2H Project. These measures are applied to reduce B2H Project effects in locations where potential high and moderate initial impacts or impacts on trail resources (direct and indirect) are predicted through the analysis.

Measures aimed at avoidance and minimization of impacts on NHT components, including the Oregon NHT, Lewis and Clark NHT, and Study Trails, would be applied for the life of the impacts from the B2H Project. For any unavoidable residual effects on the values and setting of the Oregon NHT, Lewis and Clark NHT, and Study Trails (i.e., effects remaining despite application of selective mitigation measures), compensatory mitigation would be required at a degree commensurate with the level of remaining impacts and could include actions such as fee-purchases, easements, and restoration work.

The POD will further refine the application of mitigation for the development and implementation of the B2H Project based on final design of the B2H Project, the HPMP, and the National Trails Mitigation Plan (plan framework located in Appendix C), including construction monitoring and off-site mitigation measures (in addition to selective mitigation measures) as appropriate. Specific selective mitigation measures (Table 2-13) identified for NHTs and Study Trails include:

- **Selective Mitigation Measure 2 (Use Existing Access or Stream Crossings, or both, for Sensitive Resources Avoidance)**. This mitigation measure would be applied where flat terrain and vegetation would allow for cross-country access. This measure would reduce visual contrast by limiting the amount of soil color exposed during the construction process, which reduces contrast between the color of the soil and vegetation and allows for accelerated vegetation recovery. Additionally, where located near contributing trail segments, this mitigation measure would route construction access roads in a manner to avoid direct impacts on those trail segments or to occur in already disturbed settings.
- **Selective Mitigation Measure 4 (Minimize Slope Cut and Fill for Access and Work Areas)**. This mitigation measure would be applied in areas identified as access level 2, 4, 5, and 6 where impacts would occur on views from trail-associated viewing locations (i.e., where switchbacks likely would be required for construction and maintenance; refer to Table 2-9). The mitigation measure would reduce visual contrast created by new access roads through the reduction of earthwork in sloped areas where grading could expose underlying soils, which could increase contrast in color, form, and texture. Additionally, this mitigation measure is applied along rock faces, large boulders, or exposed granite where grading in steep rocky areas would create strong visual contrast in the landscape. Blending or coloring, or both, areas of cut and fill would reduce contrast between the exposed ground and the surrounding environment but this can only be applied in disturbed areas comprising rock faces, large boulders, or exposed granite.
- **Selective Mitigation Measure 5 (Minimize Tree Clearing for Operational Clearances)**. This mitigation measure would be applied where the transmission line would cross overstory vegetation (e.g., deciduous forest, mixed conifer forest, pinyon-juniper, or oak stand) within view of trail-associated viewing locations. This selective mitigation measure would reduce impacts by

decreasing visual contrast created by the removal of overstory vegetation (trees) and the hard visual line created by the cleared right-of-way or forest interface as well as screening views from trail-associated viewing locations by limiting clearing in the immediate foreground. In addition to reducing visual contrast, this selective mitigation measure would minimize disturbance in characteristic vegetation communities.

- **Selective Mitigation Measure 6 (Limit New or Improved Accessibility to Areas Previously Inaccessible)**. This mitigation measure would be applied where access and tower pads that were needed for construction, but not for maintenance, would be rehabilitated within view of trail-associated viewing locations. It would reduce the modification of the line and color elements of visual contrast by rehabilitating access roads and tower pads that are not required after construction is complete.
- **Selective Mitigation Measure 7 (Tower Design Modification)**. This mitigation measure would be applied where certain tower types (or finish materials) would match existing towers of parallel transmission lines or where certain tower types (or finish materials) would have greater absorption into the surrounding landscape as viewed from trail-associated viewing locations. This includes coloration of the towers with natina or other techniques to reduce the level of contrast introduced by the B2H Project into the viewshed. This measure would reduce visual contrast by limiting the number of different transmission tower types that would be viewed and by using the varied texture of background landforms to backdrop the structures, or to better match the characteristic landscape, so the structures begin to blend into the setting.
- ***Selective Mitigation Measure 8 (Span and/or Avoid Sensitive Features)***. This mitigation measure would be applied where the transmission line would cross a linear trail-associated viewing location (e.g., a contributing trail segment or an auto tour route) or within view of trail-associated viewing locations where selective tower placement or micro-siting would reduce impacts. This includes moving towers off of high points, or other highly visible areas, to reduce the level of contrast introduced into these trail-associated viewsheds by using the varied texture of background landforms to backdrop the structures.
- **Selective Mitigation Measure 9 (Match Transmission Line Spans)**. This mitigation measure would be applied where an existing line would be paralleled to reduce impacts as viewed from trail-associated viewing locations. This mitigation measure would modify the standard tower spacing, where feasible, to better match that of the adjacent existing structures, therefore reducing the line and form elements of visual contrast by minimizing a “wall-like” effect from structures being located at different intervals.
- **Selective Mitigation Measure 10 (Maximize Span at Crossings)**. This mitigation measure would be applied where the transmission line would cross a linear trail-associated viewing location (e.g., a contributing trail segment or an auto tour route) at a perpendicular or near-perpendicular angle to offset the proposed structure from a trail segment, trail-associated travel route, or other sensitive viewpoint to the greatest extent practicable, thereby reducing dominance of the transmission line structures in a viewer’s viewshed and/or a particular landscape setting.
- **Selective Mitigation Measure 11 (Helicopter Construction)**. This mitigation measure would be applied in limited locations where access is difficult due to steep terrain and impacts on trail-associated viewing locations could not be reduced though other less-intensive mitigation

measures. Helicopter construction would reduce visual contrast, particularly on form, line, and color elements, by limiting the amount of landform disturbance and vegetation removal created by the construction of new access roads.

- **Selective Mitigation Measure 14 (Overland Access)**. This mitigation measure would be applied in flat areas where no grading would be needed to access work areas within view of trail-associated viewing locations. Similar to Selective Mitigation Measure 2, the use of this selective mitigation measure would reduce visual contrast by limiting the amount of soil color exposed during the construction process, which limits visual contrast between the color of the soil and vegetation.

Residual Impacts

The impacts on NHTs and Study Trails were reassessed considering the application and effectiveness of the selective mitigation measures, and the level of residual impacts is applied as defined in Table 3-452. The estimated residual effects are discussed in the subsequent environmental consequences section. Note, residual impact levels do not include the application of compensatory mitigation and its effect to offset impacts on NHTs and Study Trails (refer to Appendix C).

Additional Analysis

In addition to the analysis described previously in this section, a series of analyses based on viewsheds were conducted to provide other metrics to compare the Applicant's Proposed Action Alternative and the alternative routes and route variations. These additional analyses support impact narratives describing effects on the four trail-related resource categories: trail management; visual and recreation resources; historic and cultural resources, including setting; and biological, natural, and other resources.

To provide quantification of anticipated effects on trail management (as included in the Draft EIS), the extent of visibility of the B2H Project from each of the congressionally designated (or feasibility study) alignments is determined for each alternative and route variation in context with the number of miles of each trail located in the trail-specific study corridors (refer to previous Analysis Area section for the description of the study corridors). This analysis allows for comparative visibility for each NHT and Study Trail from this broad-scale trail component, which tiers in subsequent analyses using more detailed datasets (e.g., high potential historic sites, contributing trail segments, etc.). The results of this inventory, as well as the number of trail crossings by each alternative, are presented by B2H Project segment in Sections 3.2.15.6 and 3.2.15.7.

Since a variety of trail-associated viewing platforms (e.g., contributing trail segments, trail-associated cultural sites, etc.) would have views of different portions of the B2H Project alternatives, an analysis was conducted using GIS viewsheds from these viewing platforms to assess the extent of each B2H Project alternative and route variation that could be viewed. The number of miles of the B2H Project in each trail-specific study corridor was compared to the number of miles the B2H Project would be located within both the foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles) distance zones run from the trail-associated viewing platforms. Using the viewshed analysis conducted from these viewing platforms, the miles the B2H Project would be visible in the foreground and

middleground distance zones was compared to the inventory of miles located within each distance zone. This analysis was conducted for the Oregon NHT, the Lewis and Clark NHT, and each Study Trail. The results of this inventory and analysis are presented by B2H Project segment in Sections 3.2.15.6 and 3.2.15.7.

Due to the linear nature of the NPS auto tour routes, the extent of B2H Project visibility along this trail-associated resource was assessed to provide context for the determination of high, moderate, and low impacts mapped along B2H Project centerlines. Through GIS viewshed analysis, the number of miles of the auto tour route in each trail-specific study corridor was compared to the number of miles of the auto tour route where the B2H Project could be viewed within both the foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles) distance zones. This analysis was conducted for both the Oregon NHT and the Lewis and Clark NHT. The results are presented by B2H Project segment in Section 3.2.15.7.

In a similar manner, to support the assessment of impacts on contributing trail segments, the extent of visibility of the B2H Project from contributing trail segments was assessed through GIS viewshed analysis. The number of miles of contributing trail segments in the trail-specific study corridors was compared to the number of miles of trail traces where the B2H Project could be viewed within both the foreground (from 0 to 0.5 mile) and middleground (from 0.5 mile to 5 miles) distance zones. This analysis was conducted only for the Oregon NHT because data were not available for the Lewis and Clark NHT or the Study Trails. The results are presented by B2H Project segment in Section 3.2.15.7.

3.2.15.6 Affected Environment

Oregon National Historic Trail

Segment 1—Morrow-Umatilla

The Oregon NHT enters Segment 1 approximately 5 miles east of the community of Boardman, Oregon (Map 3-8a). The alignment in the western section of Segment 1 is generally west to east, trending slightly north. Existing development adjacent to the Oregon NHT in this portion of the study corridor is predominantly agricultural fields, numerous paved and two-track roads, transmission lines and towers, wind farms, and scattered ranches. A majority of this land is privately owned with small areas of BLM-administered lands including the Oregon Trail ACEC – Echo Meadows portion with an interpretive site and contributing trails traces. Additionally, I-84, Oregon NHT Auto Tour Route, begins to roughly parallel the Oregon NHT west of Pendleton and into the Blue Mountains to the end of Segment 1 near the Blue Mountain Crossing Interpretive Park.

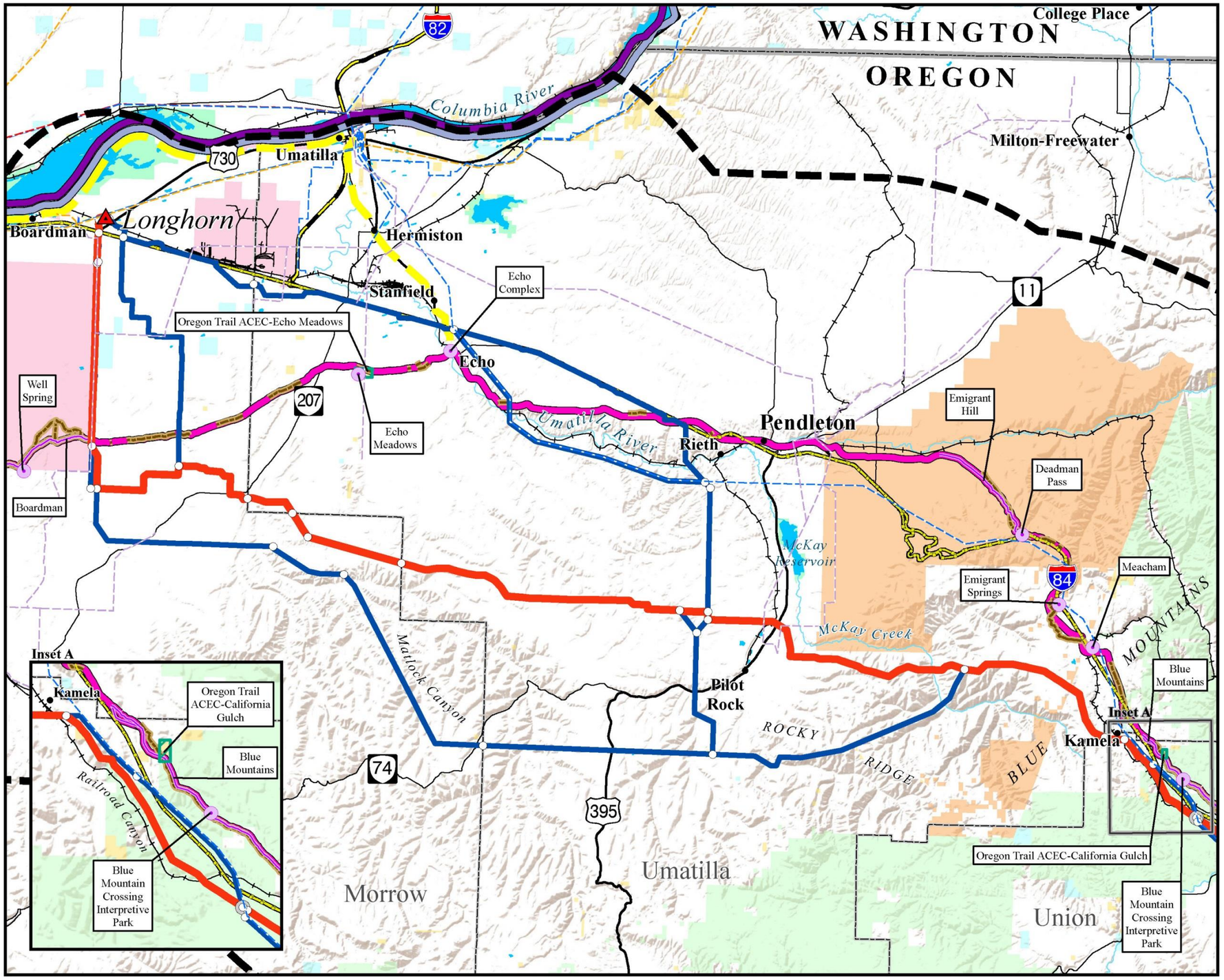
Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 1, five tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-453 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-454 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-455 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-456 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources, by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-457 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to the map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-453. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	41.4
Variation S1-B1	*18.3*
Variation S1-B2	*18.3*
East of Bombing Range Road	41.5
Applicant's Proposed Action – Southern Route	41.4
West of Bombing Range Road – Southern Route	35.8
Longhorn	35.6
Interstate 84	56.0
Variation S1-A1	*26.2*
Variation S1-A2	*26.2*
Interstate 84 – Southern Route	56.0



Map 3-8a

National Historic Trails and Study Trails Segment 1 – Morrow-Umatilla

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10
Miles

1:375,000 or 1 inch = 6 miles

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Table 3-454. Oregon National Historic Trail Management Component Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	High Potential Historic Sites[1]						High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]	
	Well Spring	Echo Meadows	Echo Complex	Emigrant Springs	Meacham	Blue Mountain Crossing Interpretative Park	Boardman	Blue Mountains	Oregon Trail ACEC – California Gulch	Oregon Trail ACEC – Echo Meadows
Applicant's Proposed Action	√	–	–	√	√	√	√	√	√	–
Variation S1-B1	–	–	–	–	–	√	–	√	√	–
Variation S1-B2	–	–	–	–	–	√	–	√	√	–
East of Bombing Range Road	√	–	–	√	√	√	√	√	√	–
Applicant's Proposed Action – Southern Route	√	–	–	√	√	√	√	√	√	–
West of Bombing Range Road – Southern Route	√	–	–	√	√	√	√	√	√	–
Longhorn	–	–	–	√	√	√	√	√	√	–
Interstate 84	–	√	√	√	√	√	–	√	√	√
Variation S1-A1	–	–	√	–	–	–	–	–	–	–
Variation S1-A2	–	–	√	–	–	–	–	–	–	–
Interstate 84 – Southern Route	–	√	√	√	√	√	–	√	√	√

Table Note: [1]Located in trail-specific study corridor

Table 3-455. Oregon National Historic Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	91.9	4.8	32.4
Variation S1-B1	*6.4*	*3.1*	*3.3*
Variation S1-B2	*6.4*	*4.9*	*1.5*
East of Bombing Range Road	92.3	4.1	33.4
Applicant's Proposed Action – Southern Route	99.1	4.8	32.4
West of Bombing Range Road – Southern Route	95.6	4.8	22.4
Longhorn	88.2	4.1	26.0
Interstate 84	84.7	28.0	21.0
Variation S1-A1	*18.5*	*15.4*	*3.2*
Variation S1-A2	*18.5*	*1.9*	*16.6*
Interstate 84 – Southern Route	93.4	28.0	21.0

Table 3-456. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 1—Morrow-Umatilla		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	4.3	28.1
Variation S1-B1	*3.3*	*14.1*
Variation S1-B2	*5.1*	*12.3*
East of Bombing Range Road	4.4	28.2
Applicant's Proposed Action – Southern Route	4.3	28.1
West of Bombing Range Road – Southern Route	4.3	28.1
Longhorn	4.3	30.7
Interstate 84	34.8	34.7
Variation S1-A1	*15.7*	*10.3*
Variation S1-A2	*1.3*	*24.6*
Interstate 84 – Southern Route	34.8	34.7

Table 3-457. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 1—Morrow-Umatilla		
Alternative Route	**Miles of Segments in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	0.4	36.2
Variation S1-B1	*0.0*	*14.0*
Variation S1-B2	*0.5*	*14.0*
East of Bombing Range Road	0.4	36.4
Applicant's Proposed Action – Southern Route	0.4	36.2
West of Bombing Range Road – Southern Route	0.4	34.1
Longhorn	0.7	23.3
Interstate 84	0.4	22.7
Variation S1-A1	*0.4*	*2.7*
Variation S1-A2	*0.4*	*2.7*
Interstate 84 – Southern Route	0.4	22.7

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The following high potential sites are located in the trail-specific study corridor:

- Well Spring
- Emigrant Springs

- Meacham
- Blue Mountain Crossing Interpretive Park

High Potential Historic Route Segments. The following segments are located in the trail-specific study corridor:

- Boardman
- Blue Mountains

Auto Tour Routes*.* The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Boardman past Pendleton climbing Deadman's Pass into the Blue Mountains.

Areas of Critical Environmental Concern*.* The BLM manages a portion of the Oregon Trail ACEC, California Gulch, in the study corridor, which excludes the construction of additional rights-of-way.

Other Trail Management Areas*.* The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the B2H Project, west of the Blue Mountains, are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the Applicant's Proposed Action Alternative are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road. Further to the east, the alternative route is located in proximity to the Oregon NHT in the Blue Mountains with a more enclosed setting generated by steep terrain and tall, dense evergreen vegetation, which limits visibility of large expanses of the trail setting. An existing 230-kV transmission line is located in proximity to the alternative route across the Blue Mountains. I-84 traverses both of these landscapes but is located in closer proximity to the Oregon NHT in the Blue Mountains.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP # 3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 36.6 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the Naval Weapons System Training Facility Boardman and BLM Oregon Trail ACEC – California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in trail-specific study corridor for this alternative route:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT west of the Blue Mountains is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with riparian vegetation adjacent to Butter Creek and the Umatilla River as well as isolated springs used for water along the Oregon NHT (e.g., Wells Spring). In the Blue Mountains, vegetation adjacent to the Oregon NHT is comprised of evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing transmission lines, wind farms, paved and two-track roads, and I-84.

Variation S1-B1

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4)***.***

High Potential Historic Sites. The Blue Mountain Crossing Interpretive Park site is located in the trail-specific study corridor.

High Potential Historic Route Segments. The Blue Mountains trail segment is located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Route uses the alignment of I-84 in this area.

Areas of Critical Environmental Concern. The BLM manages a portion of the Oregon Trail ACEC, California Gulch, that is located in the study corridor. Management for the Oregon Trail ACEC excludes construction of additional rights-of-way. Refer to the Land Use Section 3.2.6 for analysis.

Other Trail Management Areas. The USFS manages an area of National Forest System Lands within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

Route Variation S1-B1 is located in the Blue Mountains, in proximity to the Oregon NHT, in an area defined by steep terrain and tall, dense evergreen vegetation limiting visibility of large expanses of the trail setting. An existing 230-kV transmission line is located in proximity to the route variation in this area as well as I-84. These existing features have modified the existing setting but due to the dense vegetation, these features are typically only visible on ridges or from open grassland meadows.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation site was identified in proximity to the route variation:

- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-457, 14 miles of contributing trail traces are located in the trail-specific study corridor for Variation S1-B1. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the study corridor:

- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)
- Blue Mountain Crossing Interpretive Park

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is comprised of evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT include an existing transmission line, paved and two-track roads, and I-84.

Variation S1-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S1-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to that of Variation S1-B1 except this variation is closer to the existing 230-kV transmission line and I-84 (Oregon NHT Auto Tour Route).

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-457, 14.5 miles of contributing trail traces are located in the trail-specific study corridor for Variation S1-B2. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – California Gulch section.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the study corridor for this route variation:

- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)
- Blue Mountain Crossing Interpretive Park

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as that of Variation S1-B1.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Well Spring site is located approximately 2 to 4 miles west of the additional action, depending on the design option selected.

High Potential Historic Route Segments. The Boardman segment is located adjacent to the additional action.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in proximity to the additional action.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the additional action are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been

converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the additional action are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road.

Recreation opportunities along the Oregon NHT in this area are limited to the Wells Spring Interpretive Site (Visual Resource KOP #2-22).

Historic and Cultural Resources

Contributing Trail Segments. A series of contributing trail traces are located adjacent to the Connection Action within the NWSTF Boardman.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in proximity to the additional action:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with isolated springs used for water along the Oregon NHT (e.g., Wells Spring). Existing modifications in proximity to this portion of the Oregon NHT include agricultural development, existing transmission lines, wind farms, and paved and two-track roads.

East of Bombing Range Road Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456) the following trail-associated recreation sites were identified in proximity to this alternative route:

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP # 3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 36.8 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor for this alternative route:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument (near Meacham)
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to this alternative route:

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP #3-16)

- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 36.6 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Well Spring site is located approximately 2-4 miles to west of the additional action, depending on the design option selected.

High Potential Historic Route Segments. The Boardman segment is located adjacent to the additional action.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in proximity to the additional action.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the additional action are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been

converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the additional action are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road.

Recreation opportunities along the Oregon NHT in this area are limited to the Wells Spring Interpretive Site (Visual Resource KOP #2-22).

Historic and Cultural Resources

Contributing Trail Segments. A series of contributing trail traces are located adjacent to the Connection Action within the NWSTF Boardman.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in proximity to the additional action:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with isolated springs used for water along the Oregon NHT (e.g., Wells Spring). Existing modifications in proximity to this portion of the Oregon NHT include agricultural development, existing transmission lines, wind farms, and paved and two-track roads.

West of Bombing Range Road – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to this alternative route:

- Wells Spring Interpretive Site (Visual Resource KOP #2-22)
- Emigrant Springs State Heritage Area (Visual Resource KOP # 3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 34.5 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Well Spring site is located approximately 2 to 4 miles west of the additional action, depending on the design option selected.

High Potential Historic Route Segments. The Boardman segment is located adjacent to the additional action.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in proximity to the additional action.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the additional action are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occurring between the agricultural lands. Additionally, a large portion of the lands to the west of the

additional action are associated with NWSTF Boardman, consisting primarily of grasslands and sagebrush steppe, with an existing transmission line on either side of Bombing Range Road.

Recreation opportunities along the Oregon NHT in this area are limited to the Wells Spring Interpretive Site (Visual Resource KOP #2-22).

Historic and Cultural Resources

Contributing Trail Segments. A series of contributing trail traces are located adjacent to the Connection Action within the NWSTF Boardman.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in proximity to the additional action:

- Upper Well Spring
- Well Spring Pioneer Campsite
- Well Spring Pioneer Cemetery
- Sand Hollow Battlefield 1848
- Emigrant Springs

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands with isolated springs used for water along the Oregon NHT (e.g., Wells Spring). Existing modifications in proximity to this portion of the Oregon NHT include agricultural development, existing transmission lines, wind farms, and paved and two-track roads.

Longhorn Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The following high potential sites are located in the trail-specific study corridor:

- Emigrant Springs
- Meacham
- Blue Mountain Crossing Interpretive Park

High Potential Historic Route Segments. The following segments are located in the trail-specific study corridor:

- Boardman
- Blue Mountains

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Boardman past Pendleton climbing Deadman's Pass into the Blue Mountains.

Areas of Critical Environmental Concern. The BLM manages a portion of the Oregon Trail ACEC, California Gulch, in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas. The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative except instead of being located adjacent to the NWSTF Boardman; this route bisects the Boardman Tree Farm and runs along the edge of irrigated agricultural lands near the Oregon NHT.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to this alternative route:

- Emigrant Springs State Heritage Area (Visual Resource KOP #3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 30.0 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – California Gulch section (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Sand Hollow Battlefield 1848
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Blue Mountain Crossing Interpretive Park
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The following sites are located in the trail-specific study corridor:

- Echo Meadows (in BLM Oregon Trail ACEC – Echo Meadows)
- Echo Complex
- Emigrant Springs
- Meacham
- Blue Mountain Crossing Interpretive Park

High Potential Historic Route Segments. The Blue Mountains segment is located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Boardman past Pendleton climbing Deadman's Pass into the Blue Mountains.

Areas of Critical Environmental Concern. The BLM manages two portions of the Oregon Trail ACEC, Echo Meadows and California Gulch, in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas. The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with the portion of the Oregon NHT adjacent to the B2H Project, west of the Blue Mountains, are mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occur between the agricultural lands. This alternative route parallels I-84, and adjacent development, when in proximity to the Oregon NHT. This alternative also crosses a few riparian corridors adjacent to the Oregon NHT, with the Umatilla River being the largest in scale west of Pendleton.

Further to the east, the alternative route is located in proximity to the Oregon NHT in the Blue Mountains with a more enclosed setting generated by steep terrain and tall, dense evergreen vegetation which limits visibility of large expanses of the trail setting. An existing 230-kV transmission line is located in proximity to the alternative route across the Blue Mountains. I-84 traverses both of these landscapes but is located in closer proximity to the Oregon NHT in the Blue Mountains.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-456), the following trail-associated recreation sites were identified in proximity to the alternative route:

- Echo Meadow Interpretive Site (Visual Resource KOP #3-27)
- Emigrant Springs State Heritage Area (Visual Resource KOP #3-16)
- Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32)

Historic and Cultural Resources

Contributing Trail Segments. As presented in Table 3-457, 23.1 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – Echo Meadows and California Gulch sections (NHT Inventory Observation Point 1-2).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Ewing Crossing
- Echo Meadows
- Echo-Pioneer Campsite
- Possible Fort Henrietta
- Echo-Indian Agent Home
- Meeker Monument
- Emigrant Springs
- Pioneer Burial and Monument
- Cemetery (neat Meacham)
- Campsite (near California Gulch)
- Stage Station (near Pack Rat Spring)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Interstate 84 Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Interstate 84 Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Interstate 84 Alternative.

Biological, Natural, and Other Resources

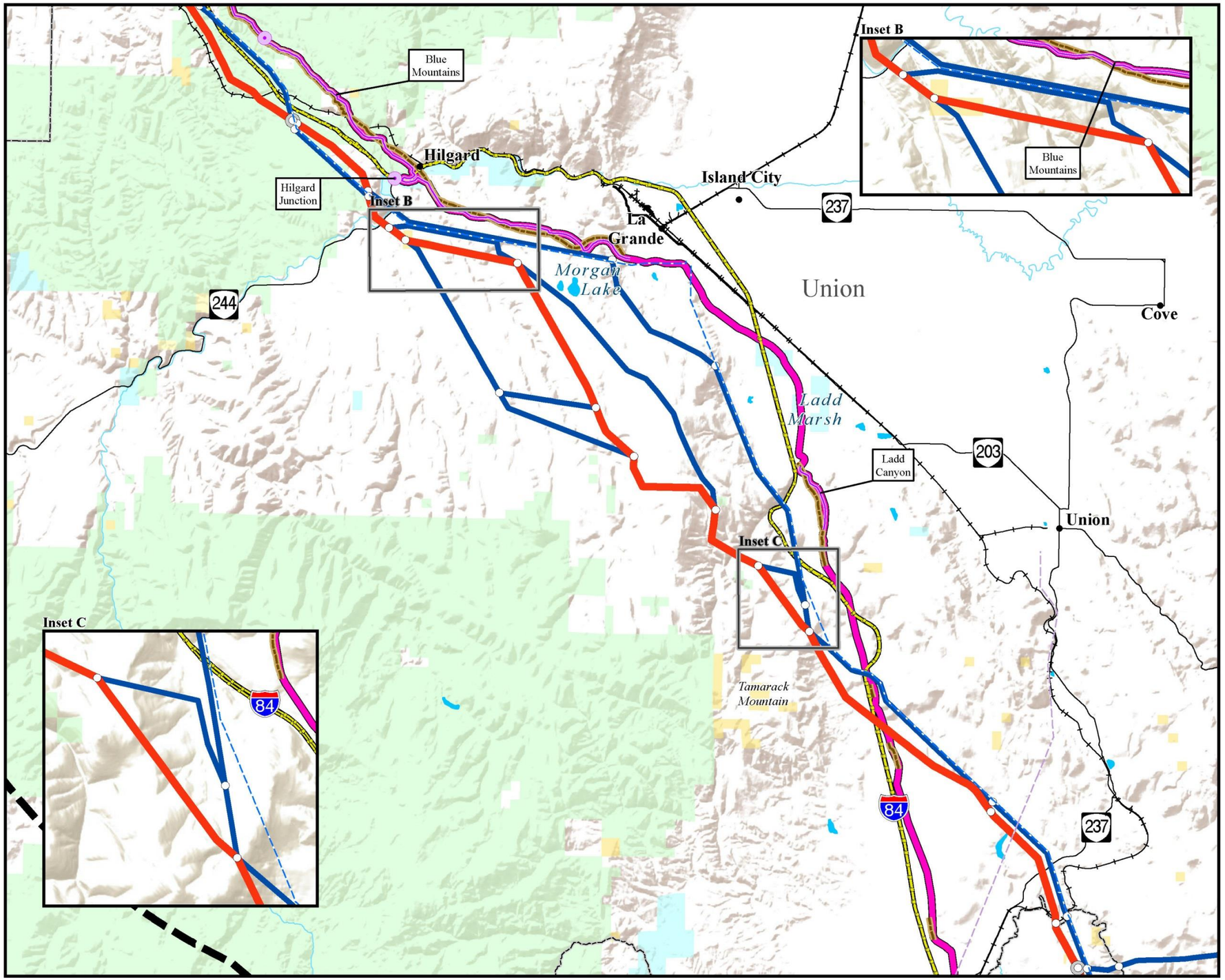
The existing condition of the environment relevant to biological, natural, and other resources is similar to the Applicant's Proposed Action Alternative.

Segment 2—Blue Mountains

The alignment of the Oregon NHT within Segment 2 begins approximately 3 miles northwest of the Hilgard, Oregon (Map 3-8b). This portion of the Oregon NHT also traverses the forested hills of the Blue Mountains. This forested area contains a series of unnamed two-track and off-road vehicle roads, but is otherwise undeveloped. Just south of Hilgard, the Oregon NHT turns to the west and crosses I-84 and Highway 244 (also known as the Ukiah-Hilgard Highway) before veering to the southeast. This portion of the Oregon NHT passes to the west of La Grande and along the western edge of the Grande Ronde River valley. Development adjacent to the Oregon NHT in this area is predominantly agricultural and urban development associated with the city of La Grande. After La Grande, the Oregon NHT turns south toward the community of North Powder (in Segment 3) and crosses over I-84 three times. Between La Grande and North Powder, the Oregon NHT traverses across areas of agricultural uses as well as areas of relatively undisturbed lands with the exception of I-84 and an existing 230-kV transmission line.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 2, five tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-458 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-459 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-460 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).



Map 3-8b

National Historic Trails and Study Trails Segment 2 – Blue Mountains

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:175,000 or 1 inch = 3 miles

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- Table 3-461 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources, by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-462 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-458. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	45.7
Variation S2-A1	*13.9*
Variation S2-A2	*13.9*
Variation S2-B1	*14.6*
Variation S2-B2	*14.6*
Variation S2-C1	*22.6*
Variation S2-C2	*22.6*
Variation S2-E1	*11.9*
Variation S2-E2	*11.9*
Variation S2-F1	*21.3*
Variation S2-F2	*21.2*
Glass Hill	45.7
Variation S2-D1	*14.4*
Variation S2-D2	*12.5*
Mill Creek	45.6

Table 3-459. Oregon National Historic Trail Management Component Inventory Data for Segment 2—Blue Mountains

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]
	Hilgard Junction	Blue Mountains	Ladd Canyon	
Applicant's Proposed Action	√	√	√	None
Variation S2-A1	√	√	–	None
Variation S2-A2	√	√	–	None
Variation S2-B1	√	√	–	None
Variation S2-B2	√	√	–	None
Variation S2-C1	√	√	–	None
Variation S2-C2	√	√	–	None
Variation S2-E1	–	–	√	None
Variation S2-E2	–	–	√	None

Table 3-459. Oregon National Historic Trail Management Component Inventory Data for Segment 2—Blue Mountains

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]
	Hilgard Junction	Blue Mountains	Ladd Canyon	
Variation S2-F1	–	–	√	None
Variation S2-F2	–	–	√	None
Glass Hill	√	√	√	None
Variation S2-D1	–	√	–	None
Variation S2-D2	–	√	–	None
Mill Creek	√	√	√	None

Table Note: [1]Located in the trail-specific study corridor

Table 3-460. Alternative Oregon National Historic Trail Viewing Location Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	33.8	5.6	28.0
Variation S2-A1	*2.8*	*2.5*	*0.4*
Variation S2-A2	*2.9*	*0.3*	*2.6*
Variation S2-B1	*3.7*	*1.0*	*2.6*
Variation S2-B2	*3.8*	*0.1*	*3.7*
Variation S2-C1	*9.3*	*0.0*	*9.3*
Variation S2-C2	*8.8*	*0.0*	*8.8*
Variation S2-E1	*2.3*	*0.0*	*2.3*
Variation S2-E2	*2.6*	*0.6*	*2.0*
Variation S2-F1	*12.1*	*2.1*	*9.9*
Variation S2-F2	*12.2*	*1.7*	*10.5*
Glass Hill	33.7	5.5	28.1
Variation S2-D1	*4.3*	*0.0*	*4.3*
Variation S2-D2	*4.1*	*0.0*	*4.1*
Mill Creek	34.0	8.5	25.5

Table 3-461. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 2—Blue Mountains

Alternative Route	Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone	Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	5.4	42.7
Variation S2-A1	*3.7*	*10.1*
Variation S2-A2	*0.8*	*13.1*
Variation S2-B1	*0.0*	*14.8*
Variation S2-B2	*0.0*	*14.8*

Table 3-461. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 2—Blue Mountains		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Variation S2-C1	*0.0*	*24.6*
Variation S2-C2	*0.0*	*24.6*
Variation S2-E1	*0.0*	*14.1*
Variation S2-E2	*1.4*	*12.7*
Variation S2-F1	*1.6*	*21.1*
Variation S2-F2	*1.7*	*21.0*
Glass Hill	5.4	36.2
Variation S2-D1	*0.0*	*7.2*
Variation S2-D2	*0.0*	*7.0*
Mill Creek	6.4	41.7

Table 3-462. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 2—Blue Mountains		
Alternative Route	**Miles of Segments in Extent in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	0.6	20.4
Variation S2-A1	*0.0*	*12.8*
Variation S2-A2	*0.0*	*12.8*
Variation S2-B1	*0.0*	*11.1*
Variation S2-B2	*0.2*	*10.9*
Variation S2-C1	*0.0*	*10.9*
Variation S2-C2	*0.0*	*10.9*
Variation S2-E1	*0.0*	*4.1*
Variation S2-E2	*0.0*	*4.1*
Variation S2-F1	*0.6*	*5.1*
Variation S2-F2	*0.4*	*5.3*
Glass Hill	0.6	20.4
Variation S2-D1	*0.0*	*5.8*
Variation S2-D2	*0.0*	*5.0*
Mill Creek	4.0	17.0
Table Note: Contributing trail trace data also include segments where eligibility has not yet been determined		

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the trail-specific study corridor.

High Potential Historic Route Segments. The following segments are located in the trail-specific study corridor:

- Blue Mountains
- Ladd Canyon

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Hilgard past La Grande to North Powder.

Other Trail Management Areas. The USFS manages an area within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT adjacent to the B2H Project, include the Blue Mountains with its enclosed setting generated by steep terrain and tall, dense evergreen vegetation. Near Hilgard, the setting associated with the Oregon NHT includes the crossing of the Grande Ronde River with its steep canyon walls and dense vegetation. A portion of this area was designated by the State of Oregon as the Hilgard Junction State Park. Continuing to the south, along the west side of La Grande, the Oregon NHT descends into rolling foothills with more grassland meadows before entering the flat Grande Ronde Valley. After passing through Ladd Canyon the Oregon NHT enters Clover Creek Valley, north of North Powder, which has been largely converted to irrigated agricultural use. I-84 is located in proximity to the Oregon NHT through most of Segment 2 but does not begin directly paralleling the NHT until Ladd Canyon to North Powder. The Applicant's Proposed Action Alternative parallels an existing 230-kV transmission line until west of La Grande, where the alternative turns to the southeast. South of La Grande, at the crossing of I-84, the alternative begins to parallel the 230-kV transmission line again until the end of Segment 2.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation site was identified in proximity to the Applicant's Proposed Action Alternative:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 21.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Pioneer Spring
- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)

- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)
- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT transitions from evergreen forests in the Blue Mountains with small, open grassland meadows, to more grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in the Grande Ronde and Clover Creek valleys. Near Hilgard, the Applicant's Proposed Action Alternative crosses the Grande Ronde River with its narrow riparian vegetation corridor. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S2-A1

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Other Trail Management Areas. The USFS manages an area of National Forest System Lands within 0.25-mile (i.e., 0.5-mile wide corridor) of the Blue Mountains trail segment as a visual corridor to prevent visual degradation of the trail setting. Additionally, construction of pipelines, power lines, roads or fences is precluded across Oregon NHT trail segments.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains is defined by the enclosed setting generated by steep terrain and tall, dense evergreen vegetation. This route variation parallels an existing 230-kV transmission line and is located approximately 0.5 mile south of I-84.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation site was identified in proximity to the route variation:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 12.8 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural site is located in the trail-specific study corridor:

- Pioneer Spring
- Hilgard Junction

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains includes dense evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, paved and two-track roads, and I-84.

Variation S2-A2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to that of Variation S2-A1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 12.8 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The Pioneer Spring trail-associated cultural site is located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-A1.

Variation S2-B1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT south of Hilgard, transition from the enclosed settings in the Blue Mountains to more rolling foothills with larger grassland meadows and open vistas. This route variation is located 0.5 mile south of an existing 230-kV transmission line. In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the Hilgard Junction State Park (Visual Resource KOP #4-19) trail-associated recreation site was identified in proximity to the variation.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 11.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT transitions from evergreen forests in the Blue Mountains with small, open grassland meadows, to more open grassland and shrub steppe meadows in the Blue Mountain foothills. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, paved and two-track roads, and I-84.

Variation S2-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-B1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 11.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-B1.

Variation S2-C1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Hilgard Junction site is located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains foothills is defined by the enclosed setting generated by tall, dense evergreen vegetation and rolling terrain southwest of La Grande.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation site was identified in proximity to the variation:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 10.9 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Hilgard Junction
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains include dense evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT are limited to an existing pipeline corridor and gravel and two-track roads.

Variation S2-C2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-C1 except this variation is closer to the existing pipeline corridor.

Historic and Cultural Resources

Contributing Trail Segments As identified in Table 3-462, 10.9 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-C1.

Variation S2-E1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. The Ladd Canyon segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains foothills is defined by the rolling terrain with grassland and shrubland vegetation on the south-facing slopes with taller, conifer vegetation on the north-facing slopes. An existing 230-kV transmission line is located 0.75 mile away from this route variation and 1 mile from I-84.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 4.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains foothills includes dense evergreen forests on the north-facing slopes and grassland and shrubland vegetation on south-facing slopes. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, paved and two-track roads, and I-84.

Variation S2-E2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-E1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-E1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 4.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S2-E1.

Variation S2-F1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. The Ladd Canyon segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT, after passing through Ladd Canyon, include areas in Clover Creek Valley, north of North Powder, which have been largely converted to irrigated agricultural use with lands along the edge of the valley characterized by rolling terrain with grassland and shrubland vegetation. I-84 is located in proximity to the Oregon NHT from Ladd Canyon to North Powder. The variation parallels an existing 230-kV transmission to the end of the Segment 2.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.7 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in Clover Creek Valley. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S2-F2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-F1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-F1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.7 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-F1.

Glass Hill Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation sites were identified in proximity to the Glass Hill Alternative:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 21.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Pioneer Spring
- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)
- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Variation S2-D1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. The Blue Mountains segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel.

Scenic and Recreation Resources

The landscape associated with this portion of the Oregon NHT in the Blue Mountains foothills is defined by the enclosed setting generated by tall, dense evergreen vegetation and rolling terrain southwest of La Grande.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.8 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

Vegetation in the Blue Mountains includes dense evergreen forests with small, open grassland meadows. Existing modifications in proximity to this portion of the Oregon NHT are limited to gravel and two-track roads.

Variation S2-D2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S2-D1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S2-D1.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 5.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S2-D1.

Mill Creek Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to those described for the Applicant's Proposed Action Alternative except the Mill Creek Alternative parallels the existing 230-kV transmission line including near La Grande.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-461), the following trail-associated recreation sites were identified in proximity to the Mill Creek Alternative:

- Hilgard Junction State Park (Visual Resource KOP #4-19)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-462, 21.0 miles of contributing trail traces are located in trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

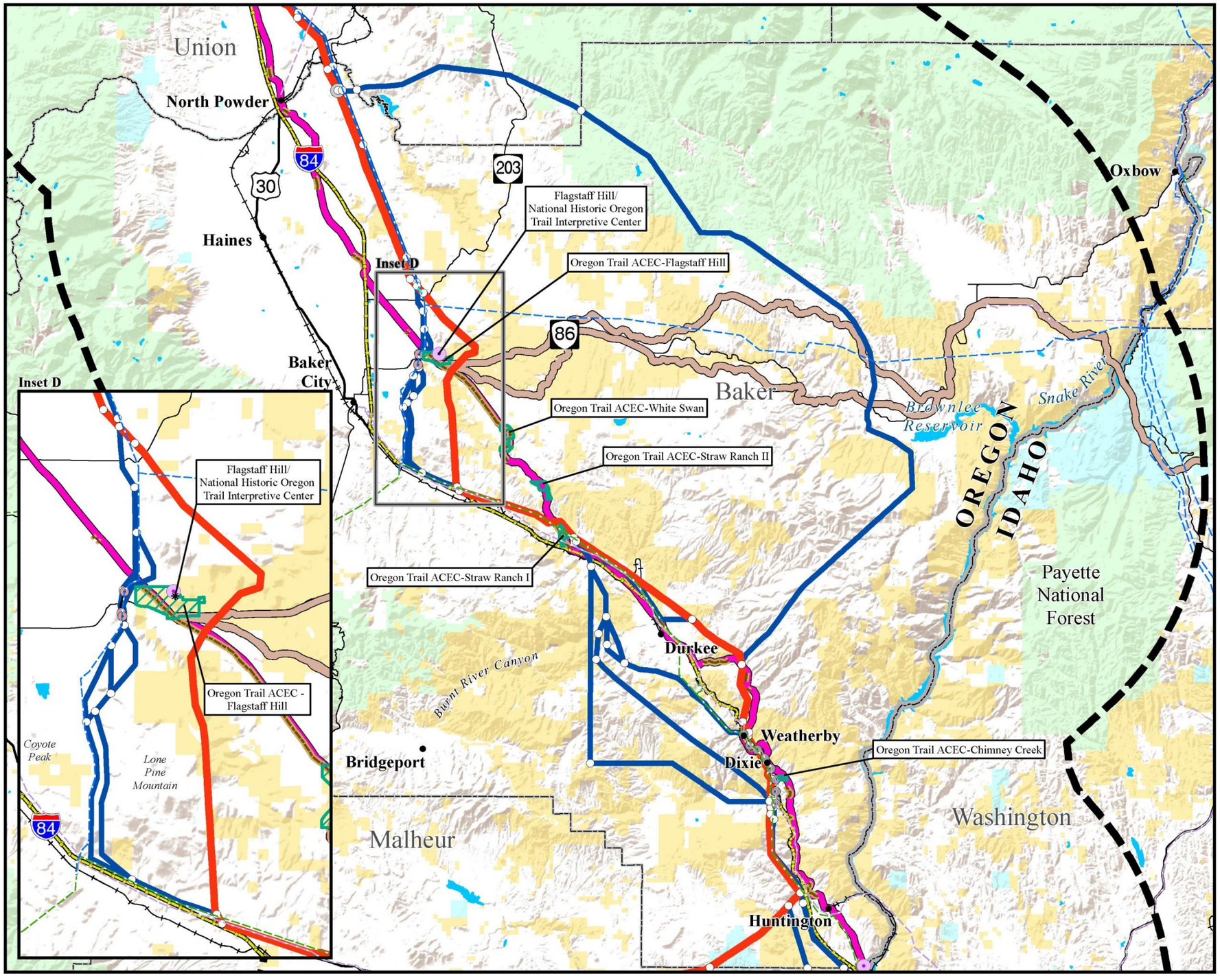
- Pioneer Spring
- Hilgard Junction
- Oregon Trail Monument (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Stone Marker (2.5 miles south of Hilgard) (NHT Inventory Observation Point 1-3)
- Emily Doone Grave 1868
- Oregon Trail Monument (La Grande)
- Stage Station (La Grande)
- Copper Kettle Grave
- Trading Post Site
- Pioneer Grave Sites (Ladd Creek)
- Trading Post Site (Ladd Creek)
- Pioneer Campsite (Ladd Creek)
- Stage Station (Ladd Creek)
- D. Dodge 1885 Inscription
- Possible Pioneer Graves (Ladd Canyon)
- Clover Creek Station
- Gentry Crossing

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Segment 3—Baker Valley

The Oregon NHT enters Segment 3 near the unincorporated community of North Powder, Oregon and continues generally in a southeasterly direction toward Baker City (Map 3-8c). The Oregon NHT crosses agricultural fields in Baker Valley and Missouri Flat and continues south along the western and southern flanks of Flagstaff Hill, where the NHOTIC is located. It then crosses Oregon Route 86 and Virtue Flat. South of Virtue Flat the Oregon NHT turns east where it parallels the I-84 and the Union Pacific Railroad to the west of the unincorporated community of Durkee. Approximately 2.7 miles southeast of Durkee, the Oregon NHT curves to the east and near the southern end of the Durkee Valley exits the segment at Dixie.



Map 3-8c

National Historic Trails and Study Trails Segment 3 – Baker Valley

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10
Miles
1:375,000 or 1 inch = 6 miles

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Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternative routes in Segment 3, five tables provide quantification and summary of trail resources in proximity to each alternative.

- Table 3-463 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-464 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-465 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-466 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-467 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-463. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	67.0
Variation S3-A1	*23.1*
Variation S3-A2	*22.8*
Variation S3-B1	*19.9*
Variation S3-B2	*19.9*
Variation S3-B3	*19.9*
Variation S3-B4	*19.9*
Variation S3-B5	*19.9*
Variation S3-C1	*35.6*
Variation S3-C2	*35.6*
Variation S3-C3	*35.6*
Variation S3-C4	*35.6*
Variation S3-C5	*34.0*
Variation S3-C6	*27.6*

Table 3-463. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Flagstaff A	67.0
Timber Canyon	31.3
Flagstaff A – Burnt River Mountain	67.0
Flagstaff B	67.0
Flagstaff B – Burnt River West	65.1
Flagstaff B – Durkee	59.0

Table 3-464. Oregon National Historic Trail Management Component Inventory Data for Segment 3—Baker Valley

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]				
	Flagstaff Hill/ NHOTIC		Oregon Trail ACEC – Flagstaff Hill	Oregon Trail ACEC – White Swan	Oregon Trail ACEC – Straw Ranch I	Oregon Trail ACEC – Ranch II	Oregon Trail ACEC – Chimney Creek
Applicant's Proposed Action	√	None	√	√	√	√	√
Variation S3-A1	√	*None*	√	–	–	–	–
Variation S3-A2	√	*None*	√	–	–	–	–
Variation S3-B1	√	*None*	√	–	–	–	–
Variation S3-B2	√	*None*	√	–	–	–	–
Variation S3-B3	√	*None*	√	–	–	–	–
Variation S3-B4	√	*None*	√	–	–	–	–
Variation S3-B5	√	*None*	√	–	–	–	–
Variation S3-C1	–	*None*	–	–	√	√	√
Variation S3-C2	–	*None*	–	–	√	√	√
Variation S3-C3	–	*None*	–	–	√	√	√
Variation S3-C4	–	*None*	–	–	√	√	√
Variation S3-C5	–	*None*	–	–	√	√	√
Variation S3-C6	–	*None*	–	–	√	√	√
Flagstaff A	√	None	√	√	√	√	√
Timber Canyon	–	None	–	–	–	–	√
Flagstaff A – Burnt River Mountain	√	None	√	√	√	√	√
Flagstaff B	√	None	√	√	√	√	√
Flagstaff B – Burnt River West	√	None	√	√	√	√	√
Flagstaff B – Durkee	√	None	√	√	√	√	√

Table Note: [1]Located in the trail-specific study corridor

Table 3-465. Oregon National Historic Trail Viewing Location Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	55.2	15.6	39.4
Variation S3-A1	*12.4*	*0.0*	*12.3*
Variation S3-A2	*12.2*	*0.0*	*12.4*
Variation S3-B1	*13.9*	*1.4*	*12.5*
Variation S3-B2	*14.4*	*3.6*	*9.3*
Variation S3-B3	*14.7*	*3.5*	*9.2*
Variation S3-B4	*14.3*	*3.5*	*8.6*
Variation S3-B5	*14.0*	*3.5*	*8.7*
Variation S3-C1	*21.1*	*9.9*	*11.2*
Variation S3-C2	*21.7*	*14.7*	*7.0*
Variation S3-C3	*21.1*	*6.9*	*14.1*
Variation S3-C4	*21.4*	*6.9*	*14.4*
Variation S3-C5	*21.0*	*2.2*	*18.7*
Variation S3-C6	*24.7*	*1.8*	*13.6*
Flagstaff A	55.3	17.7	35.7
Timber Canyon	70.3	7.9	8.6
Flagstaff A – Burnt River Mountain	55.3	14.7	38.6
Flagstaff B	56.0	17.7	36.2
Flagstaff B – Burnt River West	55.7	10.0	43.6
Flagstaff B – Durkee	59.6	9.6	38.6

Table 3-466. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 3—Baker Valley

Alternative Route	Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone	Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	11.4	53.0
Variation S3-A1	*0.0*	*19.4*
Variation S3-A2	*0.0*	*19.0*
Variation S3-B1	*0.9*	*22.4*
Variation S3-B2	*3.9*	*19.4*
Variation S3-B3	*4.3*	*19.1*
Variation S3-B4	*4.3*	*19.1*
Variation S3-B5	*3.9*	*19.4*
Variation S3-C1	*8.4*	*23.7*
Variation S3-C2	*14.4*	*17.7*
Variation S3-C3	*7.5*	*24.6*
Variation S3-C4	*7.5*	*24.6*

Table 3-466. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 3—Baker Valley		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Variation S3-C5	*2.6*	*29.5*
Variation S3-C6	*2.5*	*26.8*
Flagstaff A	14.4	50.0
Timber Canyon	6.8	19.8
Flagstaff A – Burnt River Mountain	13.4	51.0
Flagstaff B	14.7	49.7
Flagstaff B – Burnt River West	8.9	55.1
Flagstaff B – Durkee	8.8	52.8

Table 3-467. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 3—Baker Valley		
Alternative Route	**Miles of Segments in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	2.7	15.2
Variation S3-A1	*0.0*	*5.3*
Variation S3-A2	*0.0*	*5.3*
Variation S3-B1	*1.0*	*9.4*
Variation S3-B2	*0.8*	*9.6*
Variation S3-B3	*0.8*	*9.6*
Variation S3-B4	*0.7*	*9.8*
Variation S3-B5	*0.5*	*9.9*
Variation S3-C1	*0.7*	*4.5*
Variation S3-C2	*0.7*	*4.5*
Variation S3-C3	*0.0*	*5.2*
Variation S3-C4	*0.0*	*5.2*
Variation S3-C5	*0.0*	*5.2*
Variation S3-C6	*0.0*	*2.9*
Flagstaff A	2.3	15.7
Timber Canyon	0.7	4.4
Flagstaff A – Burnt River Mountain	1.6	16.3
Flagstaff B	2.6	15.4
Flagstaff B – Burnt River West	1.9	16.1
Flagstaff B – Durkee	1.9	13.8
Table Note: Contributing trail trace data also include segments where eligibility has not yet been determined		

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Flagstaff Hill/NHOTIC site is located in the trail-specific study corridor.

High Potential Historic Route Segments. No segments are located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder past Baker City to Dixie.

Areas of Critical Environmental Concern. The BLM manages several portions of the Oregon Trail ACEC (Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek) in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas. Baker County has included an overlay zone around the NHOTIC in their zoning ordinance to manage the viewshed in a manner to retain the historic character of the landscape.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City have been largely converted to irrigated agricultural use with the community of Baker City modifying the setting west of Flagstaff Hill and an existing 230-kV transmission line along the edge of Baker Valley between the NHOTIC and Baker City. At Flagstaff Hill, the landscapes adjacent to the Oregon NHT become more natural, consisting of arid rolling hills with grassland and shrubland vegetation. Other than paved and two-track roads, and development around the NHOTIC, there are few cultural modifications in the setting southeast of Flagstaff Hill. These arid rolling hill landscapes continue until the Oregon NHT enters Alder Creek adjacent to Pleasant Valley. The Oregon NHT parallels the Burnt River past Durkee to the end of Segment 3 except for a portion north of Weatherby. Turning to the east, the Oregon NHT follows Pearce Gulch and Swayze Creek avoiding a narrow canyon west of Gold Hill. The setting along the Burnt River primarily consists of a narrow riparian corridor along the river with surrounding arid hills which become steep canyon walls north of Weatherby. The bright greens associated with agricultural land uses in Durkee Valley contrast with the muted colors of the adjacent arid lands north and south of Durkee. Cultural modifications adjacent to the Oregon NHT along the Burnt River include I-84, agricultural and community development, an existing 138-kV transmission line, and other paved and two-track roads.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466 and Visual Resource KOP #5-26) including the Weatherby Rest Area (Visual Resource KOP #5-31), the following trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative:

- National Historic Oregon Trail Interpretive Center (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60)
- Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32, NHT Inventory Observation Point #2-1)
- Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33, NHT Inventory Observation Point #2-2)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor including a traces east of Durkee along Swayze Creek (Visual Resource KOP #5-30). A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –Flagstaff Hill portion, White Swan portion (NHTs Inventory Observation Point #2-4 and 2-5), and Straw Ranch I portion (Inventory Observation Point #3-5).

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Baker and Durkee valleys. The riparian corridor along the Burnt River facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 230-kV and 138-kV transmission lines, paved and two-track roads, and I-84.

Variation S3-A1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Flagstaff Hill/NHOTIC site is located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder to Baker City.

Areas of Critical Environmental Concern. The BLM manages a portion of the Oregon Trail ACEC, Flagstaff Hill, in the trail study corridor which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City, in Baker Valley, have been largely converted to irrigated agricultural use with the community of Baker City modifying the setting west of Flagstaff Hill. Cultural modifications adjacent to the Oregon NHT include an existing transmission line, I-84, and agricultural and community development.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466 and Visual Resource KOP #5-26, including the Weatherby Rest Area (Visual Resource KOP #5-31), the following trail-associated recreation sites were identified in proximity to the variation:

- National Historic Oregon Trail Interpretive Center (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60)
- Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32, NHT Inventory Observation Point #2-1)
- Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33, NHT Inventory Observation Point #2-2)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 19.4 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC –Flagstaff Hill portion.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Baker Valley. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, an existing 230-kV transmission line, paved and two-track roads, and I-84.

Variation S3-A2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-A1 except this variation is closer to the existing 230-kV transmission line.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 19.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-A1.

Variation S3-B1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Flagstaff Hill/NHOTIC site is located in the study corridor.

High Potential Historic Route Segments. No segments are located in the trail study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder to Baker City.

Areas of Critical Environmental Concern. The BLM manages a portion of the Oregon Trail ACEC, Flagstaff Hill, in the study corridor which excludes the construction of additional rights-of-way.

Other Trail Management Areas. Baker County has included an overlay zone around the NHOTIC in their zoning ordinance to manage the viewshed in a manner to retain the historic character of the landscape.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City have been largely converted to irrigated agricultural use with the community of Baker City modifying the setting west of Flagstaff Hill and an existing 230-kV transmission line along the edge of Baker Valley between the NHOTIC and Baker City. At Flagstaff Hill, the landscapes adjacent to the Oregon NHT become more natural, consisting of arid rolling hills with grassland and shrubland vegetation. Other than paved and two-track roads, and development around the NHOTIC, there are few cultural modifications in the setting

southwest of Flagstaff Hill. These arid rolling hill landscapes continue until the Oregon NHT enters Alder Creek adjacent to Pleasant Valley.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466), the following trail-associated recreation sites were identified in proximity to the variation:

- National Historic Oregon Trail Interpretive Center (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60)
- Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32, NHT Inventory Observation Point #2-1)
- Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33, NHT Inventory Observation Point #2-2)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.3 miles of contributing trail traces are located in the trail-specific study corridor. A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – Flagstaff Hill portion.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Baker and Durkee valleys. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 230-kV transmission line, paved and two-track roads, and I-84.

Variation S3-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-B1 except this variation is closer to the existing 230-kV transmission line and the NHOTIC.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.3 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-B1.

Variation S3-B3

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-B1 except this variation is closer to the existing 230-kV transmission line and the NHOTIC near Baker City and the existing 230-kV transmission line south of Baker City.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-B1.

Variation S3-B4

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to Variation S3-B1 except this variation is adjacent to the existing 230-kV transmission line, near Baker City and the NHOTIC, as well as south of Baker City.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.4 miles of contributing trail traces are located in the trail-associated study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S3-B1.

Variation S3-B5

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-B1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-B1 except this variation is adjacent to the existing 230-kV transmission line near Baker City and the NHOTIC.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 23.3 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the “Lone Tree”
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are the same as Variation S3-B1.

Variation S3-C1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Baker City to Dixie.

Areas of Critical Environmental Concern. The BLM manages several portions of the Oregon Trail ACEC (Straw Ranch I, Straw Ranch II, and Chimney Creek) in the study corridor which exclude the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of the Burnt River consist of arid rolling hills until the Oregon NHT enters Alder Creek adjacent to Pleasant Valley. The Oregon NHT then parallels the Burnt River past Durkee to the end of Segment 3 except for a portion north of Weatherby. Turning to the east, the Oregon NHT follows Pearce Gulch and Swayze Creek avoiding a narrow canyon west of Gold Hill. The setting along the Burnt River primarily consists of a narrow riparian corridor along the river with surrounding arid hills which become more steep canyon walls north of Weatherby. The bright greens associated with agricultural land uses in Durkee Valley contrast with the muted colors of the adjacent arid lands north and south of Durkee. Cultural modifications adjacent to the Oregon NHT along the Burnt River include I-84, agricultural and community development, an existing 138-kV transmission line, and other paved and two-track roads.

Other than the recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466 and Visual Resource KOP #5-26) including the Weatherby Rest Area (Visual Resource KOP #5-31), no additional trail-associated recreation sites were identified.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor including a traces east of Durkee along Swayze Creek (Visual

Resource KOP #5-30). A portion of the contributing trail traces are located in the BLM Oregon Trail ACEC – Straw Ranch I portion (Inventory Observation Point #3-5).

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Durkee Valley. The riparian corridor along the Burnt River facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 138-kV transmission line, paved and two-track roads, and I-84.

Variation S3-C2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-C1 except this variation is closer to the existing 138-kV transmission line north of Durkee.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S3-C1.

Variation S3-C3

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley.

Variation S3-C4

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley.

Variation S3-C5

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 4 miles away, through arid rugged foothills (including traversing Weatherby Mountain) until the end of Segment 3 near the community of Dixie.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 32.1 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley and paralleling the Burnt River.

Variation S3-C6

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S3-C1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to Variation S3-C1 except this variation crosses I-84 north of Durkee and then exits the B2H Project trail study corridor near Pedro Mountain and then re-enters the study corridor south of Weatherby Mountain at the end of Segment 3.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 29.3 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to Variation S3-C1 except this variation avoids crossing agricultural lands in Durkee Valley and parallels the Burnt River.

Flagstaff A Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to scenic and recreation resources are similar

to the Applicant's Proposed Action Alternative except this alternative is adjacent to the existing 230-kV transmission line west of the NHOTIC, between Flagstaff Hill and Baker City, and avoids crossing the more intact trail setting east of the NHOTIC.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the trail-specific study corridor.

High Potential Historic Route Segments. No segments are located in the trail-specific study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from North Powder past Baker City to Dixie.

Areas of Critical Environmental Concern. The BLM manage a portion of the Oregon Trail ACEC – Chimney Creek in the study corridor, which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Baker City have been largely converted to irrigated agricultural use. This alternative turns to east and avoids approaching the Oregon NHT until Durkee, where the Oregon NHT parallels the Burnt River to the end of Segment 3 except for a portion north of Weatherby. Turning to the east, the Oregon NHT follows Pearce Gulch and Swayze Creek avoiding a narrow canyon west of Gold Hill. The setting along the Burnt River primarily consists of a narrow riparian corridor along the river with surrounding arid hills which become steep canyon walls north of Weatherby. The bright greens associated with agricultural land uses in Durkee Valley contrast with the muted colors of the adjacent arid lands north and south of Durkee. Cultural modifications

adjacent to the Oregon NHT along the Burnt River include I-84, agricultural and community development, an existing 138-kV transmission line, and other paved and two-track roads.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-466) including the Weatherby Rest Area (Visual Resource KOP #5-31), no additional trail-associated recreation sites were identified in proximity to the Timber Canyon Alternative.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor including traces east of Durkee along Swayze Creek (Visual Resource KOP #5-30).

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with agricultural development in Durkee Valley. The riparian corridor along the Burnt River facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development, existing 230-kV and 138-kV transmission lines, paved and two-track roads, and I-84.

Flagstaff A – Burnt River Mountain Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is adjacent to the existing 230-kV transmission line west of the NHOTIC, between Flagstaff Hill and Baker City, and avoids crossing the more intact trail setting east of the NHOTIC. Also this alternative crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative except this alternative avoids crossing agricultural lands in Durkee Valley.

Flagstaff B Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is closer to the existing 230-kV transmission line and the NHOTIC, near Baker City, and the existing 230-kV transmission line south of Baker City.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is located in closer proximity to the existing 230-kV transmission line and the NHOTIC, near Baker City, and the existing 230-kV transmission line south of Baker City. Also this alternative crosses I-84 north of Durkee and runs parallel to the Oregon NHT, approximately 2 miles away, through arid rolling hills until the community of Weatherby.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 64.0 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Flagstaff Hill
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative except this alternative avoids crossing agricultural lands in Durkee Valley.

Flagstaff B – Durkee

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources are similar to the Applicant's Proposed Action Alternative except this alternative is closer to the existing 230-kV transmission line and the NHOTIC, near Baker City, and the existing 230-kV transmission line south of Baker City. Also this alternative crosses I-84 north of Durkee and then exits the trail-specific study corridor near Pedro Mountain and then re-enters the study corridor south of Weatherby Mountain at the end of Segment 3.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-467, 61.6 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The following trail-associated cultural sites are located in the trail-specific study corridor:

- Slough House Stage Station (Stop)
- Possible site of the "Lone Tree"
- Oregon Trail Monument

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources are similar to the Applicant's Proposed Action Alternative except this variation avoids crossing agricultural lands in Durkee Valley and paralleling the Burnt River.

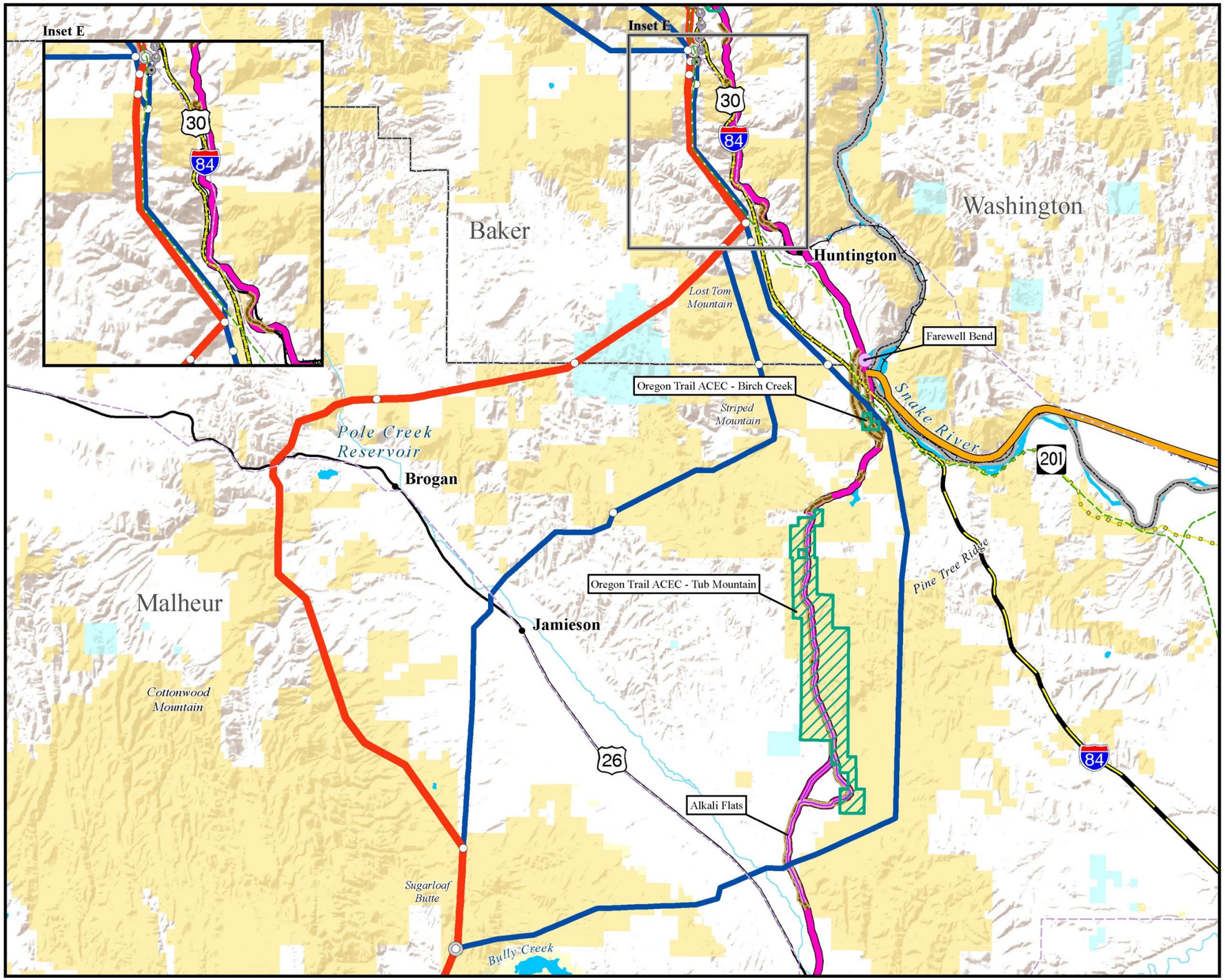
Segment 4—Brogan

From the northern portion of Segment 4, the Oregon NHT runs generally south from Dixie to Lime to Vale. The Oregon NHT generally parallels I-84 from Dixie to Farewell Bend (Map 3-8d). The surrounding land is predominately undeveloped, but there are paved and unpaved roads and scattered ranches as well as transmission lines and towers located in proximity to the Oregon NHT.

Between Lime and Huntington, the Oregon NHT generally follows Burnt River and Business U.S. Route 30 (Oregon Trail Boulevard). The Oregon NHT continues south past Tub Mountain and Alkali Springs and then crosses Willow Creek near Vale. Until reaching the agricultural lands associated with the creek, the land surrounding the Oregon NHT is predominately undeveloped. Closer to Vale the Oregon NHT passes through the city of Vale and the associated infrastructure, residential, and commercial development.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 4, five tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-468 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-469 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.



Map 3-8d

National Historic Trails and Study Trails Segment 4 – Brogan

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:200,000 or 1 inch = 3 miles

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- Table 3-470 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-471 identifies the miles of the Oregon NHT Auto Tour Route, another trail management component also associated with scenic and recreation resources, by alternative and route variation located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).
- Table 3-472 identifies the miles of contributing trail traces (historic and cultural resources) by alternative and route variation within the foreground and middleground distance zones.

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-468. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 4—Brogan

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	19.0
Variation S4-A1	*19.0*
Variation S4-A2	*19.0*
Variation S4-A3	*19.0*
Tub Mountain South	45.6
Willow Creek	28.6

Table 3-469. Oregon National Historic Trail Management Component Inventory Data for Segment 4—Brogan

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]	
	Farewell Bend	Alkali Springs	Oregon Trail ACEC – Tub Mountain	Oregon Trail ACEC – Birch Creek
Applicant's Proposed Action	–	–	–	–
Variation S4-A1	–	–	–	–
Variation S4-A2	–	–	–	–
Variation S4-A3	–	–	–	–
Tub Mountain South	√	√	√	√
Willow Creek	√	√	√	√

Table Note: [1]Located in the trail-specific study corridor

Table 3-470. Oregon National Historic Trail Viewing Location Inventory Data for Segment 4—Brogan			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	40.1	1.7	1.8
Variation S4-A1	*5.9*	*1.5*	*4.5*
Variation S4-A2	*6.0*	*2.5*	*3.4*
Variation S4-A3	*6.1*	*1.8*	*4.1*
Tub Mountain South	40.5	12.3	22.5
Willow Creek	34.6	1.7	15.7

Table 3-471. Oregon National Historic Trail Auto Tour Route Inventory Data for Segment 4—Brogan		
Alternative Route	**Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	2.4	14.5
Variation S4-A1	*2.4*	*14.4*
Variation S4-A2	*3.4*	*13.4*
Variation S4-A3	*2.2*	*14.6*
Tub Mountain South	11.3	14.5
Willow Creek	2.4	18.8

Table 3-472. Oregon National Historic Trail Contributing Trail Segments Inventory Data for Segment 4—Brogan		
Alternative Route	**Miles of Segments in Foreground (0.0 to 0.5 mile) Distance Zone**	**Miles of Segments in Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	0.2	2.2
Variation S4-A1	*0.2*	*2.2*
Variation S4-A2	*0.3*	*2.1*
Variation S4-A3	*0.3*	*2.1*
Tub Mountain South	8.7	18.3
Willow Creek	0.2	15.1
Table Notes: Contributing trail trace data also include segments where eligibility has not yet been determined		

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area where the auto tour turns to the east using the alignment Oregon Highway 201.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT, adjacent to the Applicant's Proposed Action Alternative, are limited to Burnt River Canyon from Dixie to Huntington. This area is characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands. I-84 and an existing 138-kV transmission line are located in proximity to the Oregon NHT in the narrow canyon. The Oregon NHT traverses arid hills between Huntington and Farewell Bend on the Snake River (located outside of the trail-specific study corridor), with its prominent riparian band of vegetation and modern-day recreation use (state recreation area), before the trail enters more arid lands to the south.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 2.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. The Pioneer Graves (south of Huntington) trail-associated cultural site is located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with limited agricultural development. Riparian corridors with cottonwood trees occur along the rivers and streams, including the Burnt River, facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S4-A1

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT adjacent to the variation include Burnt River Canyon from Dixie to Huntington. This area is characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands. I-84 and an existing 138-kV transmission line are located in proximity to the Oregon NHT in the narrow canyon.

Other than recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), no other trail-associated recreation opportunities are located in the trail-specific study corridor.

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 2.4 miles of contributing trail traces are located in the trail-specific study corridor.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Oregon NHT is mostly associated with the arid lands traversed including grassland and shrubland vegetation with limited agricultural development. The Burnt River riparian corridor, with cottonwood trees, facilitated access to water for the historic users of the trail in this otherwise arid landscape. Existing modifications in proximity to this portion of the Oregon NHT include community development, existing transmission lines, paved and two-track roads, and I-84.

Variation S4-A2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section. The existing condition of environment relevant to trail management is the same as Variation S4-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S4-A1 except this variation is closer to the existing 138-kV transmission line.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as Variation S4-A1.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S4-A1.

Variation S4-A3

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as Variation S4-A1.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is similar to Variation S4-A1 except this variation is closer to the existing 138-kV transmission line.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as Variation S4-A1.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Variation S4-A1.

Tub Mountain South Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Farewell Bend site is located in the study corridor.

High Potential Historic Route Segments. The Alkali Springs segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area.

Areas of Critical Environmental Concern. The BLM manages two portions of the Oregon Trail ACEC, Tub Mountain and Birch Creek, in the study corridor which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with the Oregon NHT north of Farewell Bend are the same as the Applicant's Proposed Action Alternative. South of Farewell Bend, the Oregon NHT traverses a mostly arid and rugged landscape with sagebrush and grassland vegetation. Further to the south in the Alkali Flats, the terrain becomes more subtle with similar arid vegetation. There are limited water sources except for a few springs (e.g., Tub and Mud/Alkali springs) between Willow Creek, further to the south, and the Snake River at Farewell Bend. Additionally, there are few cultural modifications in this arid, remote area. Contrasting with this aridness, the area adjacent to Willow Creek has been largely converted to irrigated agriculture land uses.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), the following trail-associated recreation sites were identified in proximity to the Tub Mountain South Alternative:

- Farewell Bend State Recreation Area (Visual Resource KOP #5-13)
- Birch Creek Interpretive Site located in the Oregon Trail ACEC – Birch Creek portion (Visual Resource KOP #8-3, NHT Inventory Observation Point # 4-1)
- Alkali Springs Interpretive Site (Visual Resource KOP #8-1, NHT Inventory Observation Point # 4-8)
- Tub Mountain Interpretive Site (Visual Resource KOP #8-103, NHT Inventory Observation Point # 4-7)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 27.0 miles of contributing trail traces are located in the trail-specific study corridor including segments associated with the Oregon Trail ACEC – Tub Mountain and Birch Creek portions (Visual Resource KOPs #8-3 and 8-24, NHT Inventory Observation Points #4-1, 4-3, 4-4, 4-5, 4-6, and 4-9).

Trail-associated Cultural Sites. The following trail-associated cultural site is located in the trail-specific study corridor:

- Pioneer Graves (south of Huntington)
- Pioneer Graves (Farewell Bend)
- Olds Ferry Site
- Birch Creek
- Tub Springs
- Mud Springs

Biological, Natural, and Other Resources

Until Farewell Bend, the vegetation adjacent to the Oregon NHT is the same as the Applicant's Proposed Action Alternative. South of Farewell Bend, vegetation continues to consist of arid grassland and shrubland communities with limited agricultural development. Due to the aridness of this area, the presence of springs (e.g., Tub and Mud/Alkali springs) was vitally important to historic users of the trail between Willow Creek and the Snake River. A narrow band of riparian vegetation along Willow Creek has been surrounded by irrigated agricultural uses which has modified the historic vegetative patterns in this portion of the Oregon NHT. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development and paved and two-track roads.

Willow Creek Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Farewell Bend site is located in the study corridor.

High Potential Historic Route Segments. The Alkali Springs segment is located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route uses the alignment of I-84, for both westbound and eastbound travel, from Dixie to Farewell Bend State Recreation Area.

Areas of Critical Environmental Concern. The BLM manages two portions of the Oregon Trail ACEC, Tub Mountain and Birch Creek, in the study corridor which excludes the construction of additional rights-of-way.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are similar to the Tub Mountain South Alternative except the B2H Project exits the trail study corridor before the Tub Mountain and Alkali Springs area and crosses Willow Creek outside of the study corridor.

In addition to recreation opportunities along the Oregon NHT Auto Tour Route (Table 3-471), the following trail-associated recreation sites were identified in proximity to the Willow Creek Alternative:

- Farewell Bend State Recreation Area (Visual Resource KOP #5-13)
- Birch Creek Interpretive Site located in the Oregon Trail ACEC – Birch Creek portion (Visual Resource KOP #5-13, NHT Inventory Observation Point # 4-1)

Historic and Cultural Resources

Contributing Trail Segments. As identified in Table 3-472, 15.3 miles of contributing trail traces are located in the trail-specific study corridor including segments associated with the Oregon Trail ACEC – Tub Mountain and Birch Creek portions (Visual Resource KOPs #8-3 and 8-24, NHT Inventory Observation Points #4-1 and 4-3).

Trail-associated Cultural Sites. The following trail-associated cultural site is located in the trail-specific study corridor:

- Pioneer Graves (south of Huntington)
- Pioneer Graves (Farewell Bend)
- Olds Ferry Site
- Birch Creek

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Tub Mountain South Alternative except the Willow Creek Alternative exits the trail study corridor before the Tub Mountain and Alkali Springs area and crosses Willow Creek outside of the trail study corridor.

Segment 5—Malheur

The Southern Alternate Route of the Oregon NHT congressional alignment is located within the study corridor from an area 2.5 miles west of the community of Owyhee to Adrian, where the NHT parallels the Snake River to Homedale (Map 3-8e). The majority of this area has been converted to irrigated agricultural uses except for the area southwest of Adrian which is characterized by arid, benchland landscapes.

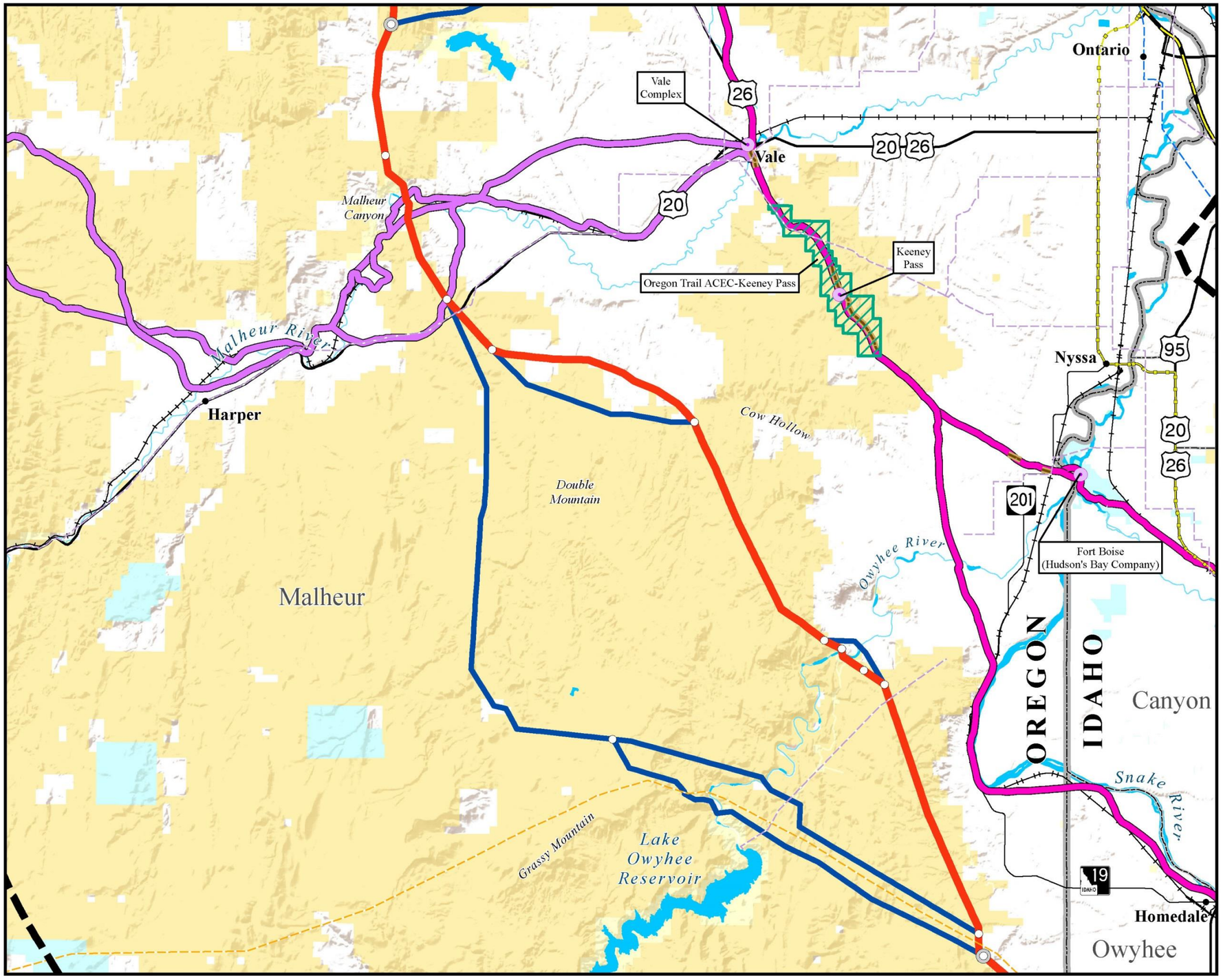
Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternative and route variations in Segment 5, three tables provides quantification and summary of trail resources in proximity to each alternative and route variations. Note, no trail management components are located in the study corridor along this segment of the B2H Project.

- Table 3-473 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-474 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-473. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 5—Malheur

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area
Applicant's Proposed Action	11.8
Variation S5-A1	*0.0*
Variation S5-A2	*0.0*
Variation S5-B1	*8.8*
Variation S5-B2	*9.7*
Malheur S	2.9
Malheur A	0.5



Map 3-8e

National Historic Trails and Study Trails Segment 5 – Malheur

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:215,000 or 1 inch = 3 miles

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Table 3-474. Oregon National Historic Trail Viewing Location Inventory Data for Segment 5—Malheur			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	40.4	0.0	11.8
Variation S5-A1	*7.4*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*0.0*	*2.6*
Variation S5-B2	*2.8*	*0.0*	*2.8*
Malheur S	43.5	0.0	5.3
Malheur A	43.1	0.0	1.7

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, please refer to the Oregon NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. No sites are located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in the study corridor.

Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT, in proximity to the B2H Project, are mostly comprised of irrigated agricultural lands in Treasure Valley with wide and expansive vistas. A portion of the Oregon NHT parallels the Snake River characterized by a narrow riparian corridor on either side of the river and on islands in the river. Existing cultural modifications are mostly limited to agricultural and community development and paved and two-track roads.

There are no trail-associated recreation areas in the trail-specific study corridor.

Historic and Cultural Resources

No contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT, in proximity to the B2H Project, is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in the Treasure Valley. Near Adrian, the Oregon NHT parallels the Snake River with its narrow riparian vegetation corridor. Existing modifications in proximity to this portion of the Oregon NHT include agricultural and community development and paved and two-track roads.

Variations S5-B1 and S5-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Malheur S Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Malheur A Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Segment 6—Treasure Valley

The Southern Alternate Route of the Oregon NHT congressional alignment is located within the study corridor paralleling the Snake River from Marsing past Givens Hot Springs (Map 3-8f).

The majority of this area has been converted to irrigated agricultural uses on both side of the river.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Oregon NHT. As part of the comparison of alternatives and route variations in Segment 6, three tables provide quantification and summary of trail resources in proximity to each alternative and route variation.

- Table 3-475 provides information relevant to trail management and presents the miles of the Oregon NHT congressional alignment located in the study corridor for each alternative and route variation.
- Table 3-476 identifies the specific trail management components (federal protection components) located in the study corridor associated with each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-477 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-475. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 6—Treasure Valley	
Alternative Route	**Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area**
Applicant's Proposed Action	18.2
Variation S6-A1	*0.0*
Variation S6-A2	*0.0*
Variation S6-B1	*15.4*
Variation S6-B2	*14.9*

Table 3-476. Oregon National Historic Trail Management Component Inventory Data for Segment 6—Treasure Valley			
Alternative Route	**High Potential Historic Sites[1]**	**High Potential Route Segments[1]**	**Areas of Critical Environmental Concern[1]**
	Givens Hot Springs		
Applicant's Proposed Action	√	None	None
Variation S6-A1	–	*None*	*None*
Variation S6-A2	–	*None*	*None*
Variation S6-B1	√	*None*	*None*
Variation S6-B2	√	*None*	*None*
Table Note: [1]Located in the trail-specific study corridor			

Table 3-477. Oregon National Historic Trail Viewing Location Inventory Data for Segment 6—Treasure Valley			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	28.0	0.0	14.9
Variation S6-A1	*9.3*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.0*	*12.1*
Variation S6-B2	*14.1*	*0.0*	*11.5*

Applicant's Proposed Action Alternative

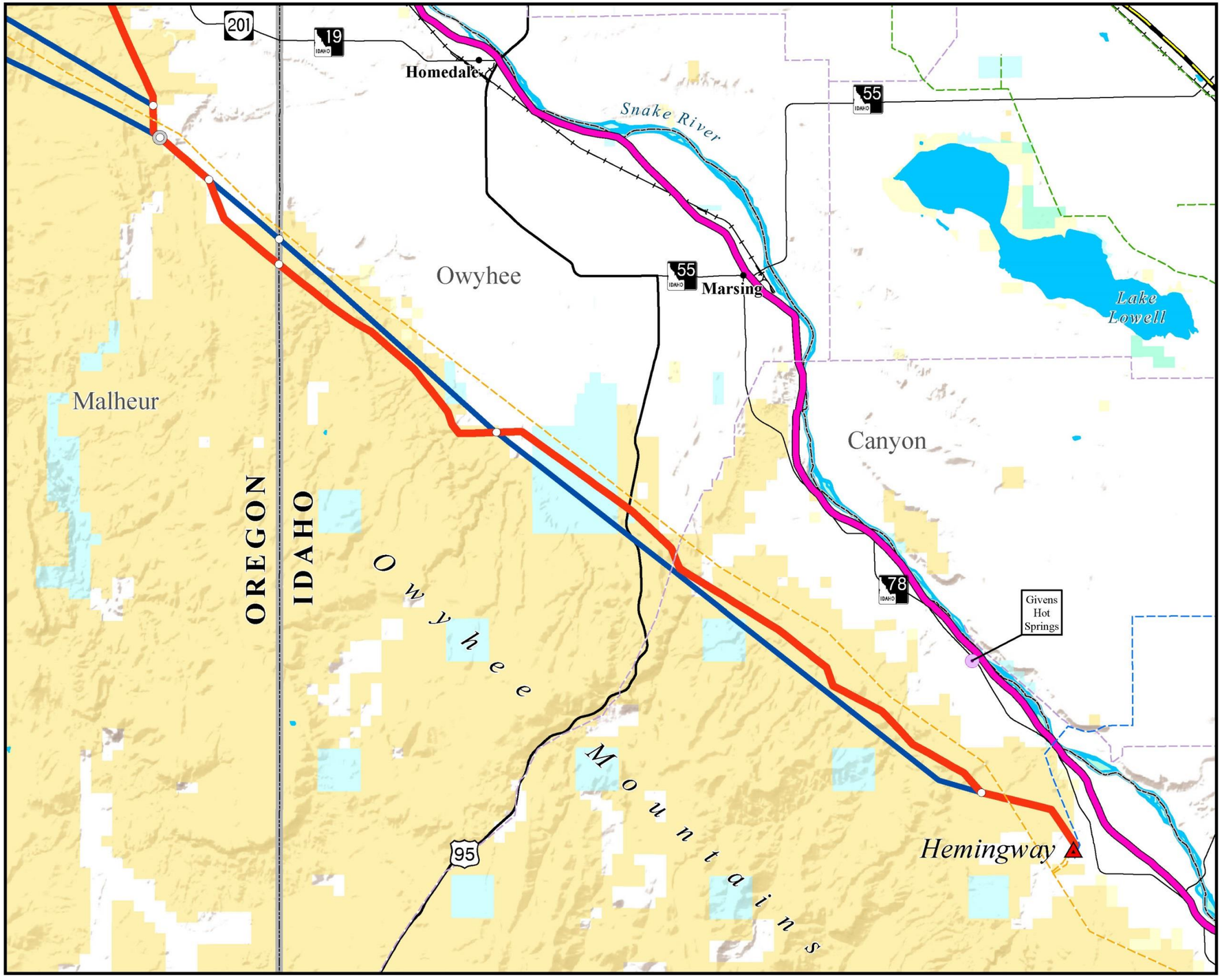
Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). Note, NHT Inventory Observation Point 5-1 is located on the Oregon NHT congressional alignment on the west bank near Fruit and Dilley islands in the Snake River.

High Potential Historic Sites. The Givens Hot Spring site is located in the study corridor.

High Potential Historic Route Segments. No segments are located in the study corridor.

Auto Tour Routes. The Oregon NHT Auto Tour Route is not located in the study corridor.



Map 3-8f

National Historic Trails and Study Trails Segment 6 – Treasure Valley

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

National Historic Trails and Study Trails[1]

Oregon National Historic Trail
- Oregon National Historic Trail (Segments 1-6)
- High Potential Historic Sites
- High Potential Trail Segments
- Associated Contributing Segments
- NPS Auto Tour Route
- Area of Critical Envrionmental Concern

Lewis and Clark National Historic Trail
- Lewis and Clark National Historic Trail (Segment 1)

Study Trails
- Upper Columbia River Route (Segment 1)
- Umatilla River Route and Columbia River to the Dalles (Segment 1)
- Goodale's Cutoff (Segment 3)
- Olds Ferry Road (Segment 4)
- Meek Cutoff (Segment 5)

Project Features
- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Node

Land Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference
- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Oregon National Historic Trail, BLM 2015; Oregon National Historic Trail High Potential Historic Sites and Segments, NPS 2015; Oregon National Historic Trail Associated Intact Segments, BLM 2003, U.S. Navy 2014; Oregon National Historic Trail Auto Tour Route, ESRI 2010; Areas of Critical Environmental Concern, BLM 2015; Lewis and Clark National Historic Trail, BLM 2015; Four Trails Feasibility Study Routes, NPS 2015 and Logan Simpson Design 2014; Land Jurisdiction, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Ventyx 2012, Logan Simpson Design 2011, Bonneville Power Administration 2009, Idaho Power Company 2007; Substations, EPG 2015; Railroads, Idaho DOT 2006, Oregon DOT 2009; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013

NOTES:
[1]Trails are depicted graphically on map in Segment 1 along the Columbia River to display adjacent trails that, in many cases, share a common alignment in some areas.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 2.5 5
Miles
1:150,000 or 1 inch = 2 miles

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Scenic and Recreation Resources

The landscapes associated with this portion of the Oregon NHT are mostly comprised of irrigated agricultural lands in Treasure Valley with wide and expansive vistas. A portion of the Oregon NHT parallels the Snake River characterized by a narrow riparian corridor on either side of the river and on islands in the river. An existing 500-kV transmission line is paralleled by the Applicant's Proposed Action Alternative in this area.

The Givens Hot Springs Campground, a trail-associated recreation area, is located in the trail-specific study corridor (Visual Resource KOP #12-4).

Historic and Cultural Resources

No contributing trail traces or additional trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along the portion of the Oregon NHT is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands in the Treasure Valley. The Oregon NHT parallels the Snake River with its narrow riparian vegetation corridor. Existing modifications in proximity to this portion of the Oregon NHT include existing transmission lines, agricultural and community development, and paved and two-track roads.

Variations S6-A1 and S6-A2

These variations are not located in proximity to the Oregon NHT.

Variations S6-B1 and S6-B2

Trail Management

For trail nature and purpose and primary uses, refer to the Oregon NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

LEWIS AND CLARK NATIONAL HISTORIC TRAIL

Segment 1—Morrow-Umatilla

Within Segment 1, the Lewis and Clark NHT follows the Columbia River for both the outbound and return route for the expedition (Map 3-8a). There are campsites and other trail-associated sites identified by the NPS along the river. In addition to the Lewis and Clark Trail Scenic Byway located in Washington State, the NPS designated the Lewis and Clark NHT Auto Tour Route in Oregon using the alignments of U.S. Highway 730 and I-84. The area adjacent to the Columbia River and NHT Auto Tour Route have been developed for agricultural use, modern home sites and associated outbuildings, development in and adjacent to community of Boardman including Boardman Park, transmission lines, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Lewis and Clark NHT. As part of the comparison of alternatives and route variations in Segment 1, three tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-478 provides information relevant to trail management and identifies by alternative the miles of the Lewis and Clark NHT congressional alignment located in the study corridor of reach alternative and route variation.
- Table 3-479 identifies the miles of the B2H Project located within 0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).
- Table 3-480 identifies the miles of the Oregon NHT Auto Tour Route (scenic and recreation resources), by alternative and route variations, located from within 0 to 0.5 mile of the B2H Project (foreground distance zone) and 0.5 to 5 miles of the B2H Project (middleground distance zone).

Refer to map MV-25 for inventory data in context with B2H alternatives and route variations.

Table 3-478. Lewis and Clark National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Congressional Alignment in the Lewis and Clark National Historic Trail Study Area
Applicant's Proposed Action	8.4
Variation S1-B1	*0.0*
Variation S1-B2	*0.0*
East of Bombing Range Road	8.4
Applicant's Proposed Action – Southern Route	8.4
West of Bombing Range Road – Southern Route	8.4
Longhorn	8.3

Table 3-478. Lewis and Clark National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Congressional Alignment in the Lewis and Clark National Historic Trail Study Area
Interstate 84	8.3
Variation S1-A1	*0.0*
Variation S1-A2	*0.0*
Interstate 84 – Southern Route	8.3

Table 3-479. Lewis and Clark National Historic Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	91.9	1.2	2.9
Variation S1-B1	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	1.2	2.9
Applicant's Proposed Action – Southern Route	99.1	1.2	2.9
West of Bombing Range Road – Southern Route	95.6	1.2	2.9
Longhorn	88.2	1.1	2.6
Interstate 84	84.7	1.1	2.1
Variation S1-A1	*18.5*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	1.1	2.1

Table 3-480. Lewis and Clark National Historic Trail Auto Tour Route Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Miles of Route in Foreground (0.0 to 0.5 mile) Distance Zone	Miles of Route in Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	1.0	9.7
Variation S1-B1	*0.0*	*0.0*
Variation S1-B2	*0.0*	*0.0*
East of Bombing Range Road	1.0	9.7
Applicant's Proposed Action – Southern Route	1.0	9.7
West of Bombing Range Road – Southern Route	1.0	9.7
Longhorn	1.0	9.9
Interstate 84	1.0	10.5
Variation S1-A1	*0.0*	*0.0*
Variation S1-A2	*0.0*	*0.0*
Interstate 84 – Southern Route	1.0	10.5

Applicant's Proposed Action Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site, identified in the NPS Lewis and Clark NHT Comprehensive Management Plan, is located in the study corridor.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in the study corridor, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

In addition to recreation opportunities along the Lewis and Clark NHT Auto Tour Route (Table 3-480) and in Boardman Park, recreation occurs along the Columbia River, including on Whitcomb Island, within the Umatilla Wildlife Refuge at the edge of the trail-specific study corridor.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in the trail-specific study corridor.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Lewis and Clark NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site is located in the proximity to the additional action.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in proximity to the additional action, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

Other than recreation opportunities along the Lewis and Clark NHT Auto Tour Route and Boardman Park, no additional trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in proximity to the additional action.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

East of Bombing Range Road Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site is located in the proximity to the additional action.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in proximity to the additional action, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

Other than recreation opportunities along the Lewis and Clark NHT Auto Tour Route and Boardman Park, no additional trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in proximity to the additional action.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

West of Bombing Range Road – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

For trail nature and purpose and primary uses, please refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4).

High Potential Historic Sites. The Boardman Park site is located in the proximity to the additional action.

High Potential Historic Route Segments. The NPS Lewis and Clark NHT Comprehensive Management Plan does not identify any high potential historic route segments but the segment of the trail located in proximity to the additional action, the Columbia River, was both the outbound and return route for the trail.

Auto Tour Routes. The Lewis and Clark NHT Auto Tour Route uses the alignment of U.S. Highway 730 to the southwest before joining the alignment of I-84 traveling west toward Boardman.

Scenic and Recreation Resources

The setting adjacent to the Lewis and Clark NHT in this area is dominated by the Columbia River which was dammed subsequent to the Lewis and Clark Expedition, resulting in much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

Other than recreation opportunities along the Lewis and Clark NHT Auto Tour Route and Boardman Park, no additional trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

No additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified in proximity to the additional action.

Biological, Natural, and Other Resources

Vegetation along this portion of the Lewis and Clark NHT is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of the Lewis and Clark NHT include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Longhorn Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except additional mileage of adjacency to the Lewis and Clark NHT Auto Tour Route (Table 3-480).

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except additional mileage of adjacency to the Lewis and Clark NHT Auto Tour Route (Table 3-480).

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

Trail Management

For trail nature and purpose and primary uses, refer to the Lewis and Clark NHT Trail History section (Section 3.2.15.4). The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except additional mileage of adjacency to the Lewis and Clark NHT Auto Tour Route (Table 3-480).

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

UPPER COLUMBIA RIVER ROUTE STUDY TRAIL

Segment 1—Morrow-Umatilla

The alignment under study by the NPS to be added to the Oregon NHT, known as the Upper Columbia River Route, occurs entirely along the Columbia River within the study corridor (Map 3-8a) connecting to the Oregon NHT west of Pendleton via the overland Whitman Mission Route Study Trail (located outside of the study area) and at The Dalles farther downstream on the Columbia River. The trail is significant for its association with Lewis and Clark, the Whitman Mission, Fort Walla Walla and as an alternate route for the Oregon NHT. Similar to the description for the Lewis and Clark NHT, the area adjacent to the Columbia River has been developed for agricultural use, modern home sites and associated outbuildings, development in and adjacent to community of Boardman, transmission lines, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Upper Columbia River Route Study Trail. As part of the comparison of alternatives and route variations in Segment 1, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-481 identifies by alternative and route variation, the miles of the Upper Columbia River Route Study Trail alignment located in the study corridor.
- Table 3-482 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-481. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments within Upper Columbia River Route Trail Study Area
Applicant's Proposed Action	8.4
Variation S1-B1	*0.0*
Variation S1-B2	*0.0*
East of Bombing Range Road	8.4
Applicant's Proposed Action – Southern Route	8.4

Table 3-481. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla	
Alternative Route	**Total Miles of Study Alignments within Upper Columbia River Route Trail Study Area**
West of Bombing Range Road – Southern Route	8.4
Longhorn	8.3
Interstate 84	8.3
Variation S1-A1	*0.0*
Variation S1-A2	*0.0*
Interstate 84 – Southern Route	8.3

Table 3-482. Upper Columbia River Route Study Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.`5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	91.9	0.0	4.0
Variation S1-B1	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	4.0
Longhorn	88.2	0.0	3.7
Interstate 84	84.7	0.0	3.2
Variation S1-A1	*18.5*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	3.2

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. Within the study corridor, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Upper Columbia River Route Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. In proximity to the additional action, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

East of Bombing Range Road Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. In proximity to the additional action, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider

river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

West of Bombing Range Road – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment along the Columbia River, known as the Upper Columbia River Route Study Trail, to be added to the congressionally designated Oregon NHT. In proximity to the additional action, this trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Upper Columbia River Route Study Trail in this area is dominated by the Columbia River which was dammed subsequent to the trails' historic use, resulting in a much wider

river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Upper Columbia River Route Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Upper Columbia River Route Study Trail is primarily made up of a band of riparian vegetation along the Columbia River, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Upper Columbia River Route Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Longhorn Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

UMATILLA RIVER ROUTE AND COLUMBIA RIVER TO THE DALLES STUDY TRAIL

Segment 1—Morrow-Umatilla

Within Segment 1, the Umatilla River Route and Columbia River to The Dalles Study Trail begins near the community of Echo and roughly parallels the modern-day U.S. Highway 395 to the community of Umatilla (Map 3-8a) along the Umatilla River. North of the community of Umatilla, the trail then becomes turns to the west traveling downriver along the Columbia River toward The Dalles. The area adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail has been developed for agricultural use, modern home sites and associated outbuildings, development in and adjacent to community of Boardman, transmission lines, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Umatilla River Route and Columbia River to The Dalles Study Trail. As part of the comparison of alternatives and route variations in Segment 1, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-483 identifies, by alternative and route variation, the miles of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment located in the study corridor.

- Table 3-484 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-483. Umatilla River Route and Columbia River to The Dalles Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments in the Umatilla River Route and Columbia River to The Dalles Trail Study Area
Applicant's Proposed Action	8.4
Variation S1-B1	*0.0*
Variation S1-B2	*0.0*
East of Bombing Range Road	8.4
Applicant's Proposed Action – Southern Route	8.4
West of Bombing Range Road – Southern Route	8.4
Longhorn	8.3
Interstate 84	18.0
Variation S1-A1	*6.5*
Variation S1-A2	*6.5*
Interstate 84 – Southern Route	18.0

Table 3-484. Umatilla River Route and Columbia River to The Dalles Study Trail Viewing Location Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	91.9	0.0	4.0
Variation S1-B1	*6.4*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	4.0
Longhorn	88.2	0.0	3.7
Interstate 84	84.7	1.2	16.0
Variation S1-A1	*18.5*	*0.2*	*5.1*
Variation S1-A2	*18.5*	*0.4*	*5.9*
Interstate 84 – Southern Route	93.4	1.2	16.0

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail, to be added to Oregon NHT. Adjacent to this alternative route, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Umatilla River Route and Columbia River to The Dalles Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail, to be added to Oregon NHT. Within the trail-specific study area associated with the additional action, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

East of Bombing Range Road Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Applicant's Proposed Action – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail, to be added to Oregon NHT. Within the trail-specific study area associated with the additional action, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

West of Bombing Range Road – Southern Route Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

The NPS is studying an alignment for the Umatilla River Route and Columbia River to The Dalles Study Trail to be added to Oregon NHT. Within the trail-specific study area associated with the additional action, the trail only occurs on the Columbia River.

Scenic and Recreation Resources

The setting adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in this area is dominated by the Columbia River which has been dammed subsequent to the trails' historic use, resulting in a much wider river than during the trail's period of significance. Bands of riparian vegetation occur on either bank with lands on the Oregon-side largely converted to agricultural use and development adjacent to the community of Boardman including waterfront parks and industrial uses.

No trail-associated recreation sites were identified in proximity to the additional action.

Historic and Cultural Resources

Since the Umatilla River Route and Columbia River to The Dalles Trail is currently under NPS feasibility study, no additional historic or cultural resource data is available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is primarily made up of a band of riparian vegetation, including cottonwoods, with adjacent agricultural lands interspersed with grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural uses, existing transmission lines, paved and unpaved roads, and development in and adjacent to the community of Boardman which also includes some industrial uses along the Columbia River.

Longhorn Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative except the Study Trail also along the Umatilla River between the communities of Echo and Umatilla roughly paralleling U.S. Highway 395 in this area.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except for the Umatilla River portion between the communities of Echo and Umatilla. The landscape associated with this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is mostly level to rolling plains with a panoramic setting. Large swaths of these lands have been converted to irrigated and dryland agricultural uses with grassland and sagebrush steppe lands occur between the agricultural lands.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative except for the Umatilla River portion between the communities of Echo and Umatilla. Vegetation along the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail is mostly grassland and shrub steppe adjacent to dryland and irrigated agricultural lands. Existing modifications in proximity to this portion of the Umatilla River Route and Columbia River to The Dalles Study Trail include agricultural and community development, existing transmission lines, paved and two-track roads, and I-84.

Interstate 84 – Southern Route Alternative

Trail Management

The existing condition of the environment relevant to trail management is the same as same as Interstate 84 Alternative.

Scenic and Recreation Resources

The existing condition of the environment relevant to scenic and recreation resources is the same as Interstate 84 Alternative.

Historic and Cultural Resources

The existing condition of the environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of the environment relevant to biological, natural, and other resources is the same as Interstate 84 Alternative.

GOODALE'S CUTOFF STUDY TRAIL

Segment 3—Baker Valley

Two generally east-west trending alignments of the Goodale's Cutoff Study Trail stretches from Brownlee on the Snake River to Flagstaff Hill, east of Baker City, where the trail meets the main alignment of the Oregon NHT (Map 3-8c). The Goodale's Cutoff Study Trail passes the unincorporated community of Richland where one route turns more to the north along Eagle Creek while the other route parallels the Powder River, rejoining in Lower Powder Valley south of Keating. Within this portion of Segment 3, existing development adjacent to the Study Trail include transmission lines and towers, scattered ranches and agricultural lands, and numerous paved and unpaved roads.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Goodale's Cutoff Study Trail.

As part of the comparison of alternative routes in Segment 3, two tables provide quantification of trail resources in proximity to each alternative and route variations.

- Table 3-485 identifies the miles of the Goodale's Cutoff Study Trail alignment located in the study corridor for each alternative and route variation.
- Table 3-486 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-485. Goodale's Cutoff Study Trail Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Study Alignments in the Goodale's Cutoff Trail Study Area
Applicant's Proposed Action	21.2
Variation S3-A1	*1.5*
Variation S3-A2	*1.5*
Variation S3-B1	*21.2*
Variation S3-B2	*11.4*
Variation S3-B3	*11.4*
Variation S3-B4	*10.2*
Variation S3-B5	*10.1*
Variation S3-C1	*0.0*
Variation S3-C2	*0.0*
Variation S3-C3	*0.0*
Variation S3-C4	*0.0*

Table 3-485. Goodale's Cutoff Study Trail Inventory Data for Segment 3—Baker Valley	
Alternative Route	**Total Miles of Study Alignments in the Goodale's Cutoff Trail Study Area**
Variation S3-C5	*0.0*
Variation S3-C6	*0.0*
Flagstaff A	10.1
Timber Canyon	14.8
Flagstaff A – Burnt River Mountain	11.4
Flagstaff B	11.4
Flagstaff B – Burnt River West	11.4
Flagstaff B – Durkee	11.4

Table 3-486. Goodale's Cutoff Study Trail Viewing Location Inventory Data for Segment 3—Baker Valley			
Alternative Route	**Total Length (miles)**	**Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**	**Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**
Applicant's Proposed Action	55.2	1.5	11.3
Variation S3-A1	*12.4*	*0.0*	*0.3*
Variation S3-A2	*12.2*	*0.0*	*0.3*
Variation S3-B1	*13.9*	*1.5*	*11.0*
Variation S3-B2	*14.4*	*0.0*	*10.3*
Variation S3-B3	*14.7*	*0.0*	*10.3*
Variation S3-B4	*14.3*	*0.0*	*9.7*
Variation S3-B5	*14.0*	*0.0*	*9.7*
Variation S3-C1	*21.1*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*
Flagstaff A	55.3	0.0	10.1
Timber Canyon	70.3	5.0	19.3
Flagstaff A – Burnt River Mountain	55.3	0.0	10.1
Flagstaff B	56.0	0.0	10.6
Flagstaff B – Burnt River West	55.7	0.0	10.6
Flagstaff B – Durkee	59.6	0.0	10.6

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying two different alignments for the Goodale's Cutoff Study Trail, identified as the (1)1862 and (2) 1863 routes, to be added to the congressionally designated Oregon NHT. The two

routes generally follow a similar alignment and converge south of Flagstaff Hill meeting the main alignment of the Oregon NHT.

Scenic and Recreation Resources

The setting adjacent to the Goodale's Cutoff Study Trail in the area east of Baker City is characterized by arid rolling hills with grassland and shrubland vegetation rising above Virtue Flat. The Study Trail travels along the more level Virtue Flat which is generally intact, except for the Virtue Flat ATV area, shooting range, and paved and two-track roads. The east and west end of the study corridor contrast with these arid landscapes as Lower Powder and Baker valleys have been largely converted to irrigated agricultural uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative. Note, impacts on the NHOTIC are described under the Oregon NHT.

Historic and Cultural Resources

Since the Goodale's Cutoff Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designated NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Goodale's Cutoff Trail is mostly grassland and shrubland typical of the arid rolling hills and plains east of Baker City. Existing modifications in proximity to this portion of Goodale's Cutoff Trail include paved and two-track roads, Virtue Flat ATV area, and a shooting range.

Variations S3-A1 and S3-A2

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B1

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B2

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B3

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B4

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variation S3-B5

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except this variation is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Variations S3-C1 through S3-C6

These variations are not located in proximity to the Goodale's Cutoff Study Trail.

Flagstaff A Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff A Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Timber Canyon Alternative

Trail Management

The NPS is studying two different alignments for the Goodale's Cutoff Study Trail identified as the (1)1862 and (2) 1863 routes to be added to the congressionally designated Oregon NHT. The two routes follow a similar alignment from the Snake River, then diverge into Eagle Valley with one route turning north toward the community of New Bridge along Eagle Creek whereas the other route passes south of the community of Richland before roughly paralleling the Powder River.

Scenic and Recreation Resources

The setting adjacent to the Goodale's Cutoff Study Trail in and adjacent to Richland in Eagle Valley is characterized by the contrast between the flat, green, irrigated agricultural landscapes in Eagle Valley and the arid rolling hills rising above the valley. One route of the Goodale's Cutoff Study Trail parallels the Powder River which enters a canyon with steep, rocky walls and a narrow riparian corridor west of Eagle Valley. These settings are generally intact with agricultural and community development and paved and two-track roads.

No trail-associated recreation sites were identified in proximity to the Timber Canyon Alternative.

Historic and Cultural Resources

Since the Goodale's Cutoff Study Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designated NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Goodale's Cutoff Study Trail is mostly grassland and shrubland typical of the arid rolling hills surrounding the agriculturally developed Eagle Valley. The riparian

vegetation along the Powder River has few trees and is primarily made up of shrubby riparian species. Existing modifications in proximity to this portion of Goodale's Cutoff Study Trail include agricultural and community development and paved and two-track roads.

Flagstaff A – Burnt River Mountain Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff A – Burnt River Mountain Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Flagstaff B Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff B Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Flagstaff B – Burnt River West Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff B – Burnt River West Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Flagstaff B – Durkee

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative except the Flagstaff B – Durkee Alternative is located along the eastern edge of Baker Valley with its irrigated agricultural land uses.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

OLDS FERRY ROAD STUDY TRAIL

Segment 4—Brogan

The Olds Ferry Road Study Trail is under study by the NPS to be added to the Oregon NHT. In Segment 4, the Study Trail follows the eastern bank of the Snake River from Eaton to Farewell Bend before crossing the Snake River to its western bank to join the main alignment of the Oregon NHT (Map 3-8d). The area along the eastern bank is largely undeveloped whereas the western bank is paralleled first by Oregon Highway 201 then I-84 to Farewell Bend. An existing 138-kV transmission line also parallels the river in proximity to Farewell Bend.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Olds Ferry Road Study Trail. As part of the comparison of alternative routes in Segment 4, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-487 identifies, by alternative and route variation, the miles of the Olds Ferry Road Study Trail alignment located in the study corridor.
- Table 3-488 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-487. Old Ferry Road Study Trail Inventory Data for Segment 4—Brogan

Alternative Route	Total Miles of Study Alignments within Old Ferry Road Trail Study Area
Applicant's Proposed Action	0.0
Variation S4-A1	*0.0*
Variation S4-A2	*0.0*
Variation S4-A3	*0.0*
Tub Mountain South	7.4
Willow Creek	3.2

Table 3-488. Old Ferry Road Study Trail Viewing Location Inventory Data for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	40.1	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*
Tub Mountain South	40.5	0.0	12.4
Willow Creek	34.6	0.0	6.6

Applicant's Proposed Action Alternative and Variations S4-A1

This alternative and variations are not located in proximity to the Olds Ferry Road Study Trail.

Tub Mountain South Alternative

Trail Management

The NPS is studying an alignment south of Indian Head Mountain along the east bank of the Snake River, Olds Ferry Road Study Trail, to be added to the congressionally designated Oregon NHT. This alignment crosses the Snake River at Farewell Bend where it joins the main alignment for the Oregon NHT.

Scenic and Recreation Resources

The setting adjacent to the Olds Ferry Road Study Trail in this area is dominated by the Snake River with its band of riparian vegetation providing bright greens in an otherwise muted, arid landscape.

There are limited cultural modifications adjacent to the trail until the trail crosses the Snake River to its west bank where the area has been influenced by an existing 138-kV transmission line, I-84, and development in and around Farewell Bend.

No trail-associated recreation sites were identified in proximity to the Tub Mountain South Alternative. Note, impacts on Farewell Bend State Recreation Area are discussed under the Oregon NHT.

Historic and Cultural Resources

Since the Olds Ferry Road Study Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Olds Ferry Road Study Trail is primarily made up of a band of riparian vegetation along the Snake River, including cottonwoods, contrasting with the adjacent arid grassland and sagebrush steppe lands. Existing modifications in proximity to this portion of Olds Ferry Road Study Trail include an existing 138-kV transmission line, I-84, paved and unpaved roads, and recreation and commercial development adjacent to Farewell Bend.

Willow Creek Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as Tub Mountain South Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as Tub Mountain South Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as Tub Mountain South Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as Tub Mountain South Alternative.

MEEK CUTOFF STUDY TRAIL

Segment 5—Malheur

Two alignments of the Meek Cutoff Study Trail are under study by the NPS and are present within the northern portion of Segment 5, the Hambleton and Ragen routes, which are named for the authors of their respective researched alignments (Hambleton and Hambleton 2014; Ragen 2013). These study trail alignments travel westward from Vale, north of the Malheur River, until Malheur Canyon where an alignment associated with the Ragen route turns to the south to avoid the canyon whereas the other routes continue through Malheur Canyon, before rejoining west of Harper in Little Valley

(Map 3-8e). The land use is predominately agriculture and associated farm buildings and paved and unpaved roads through most of this area. The setting for portion of the study trail through Malheur Canyon is strongly enclosed and development is limited to gravel and two-track roads, the canal, and an abandoned railroad alignment.

Each subsequent alternative route description highlights trail management, scenic and recreation resources, historic and cultural resources, and biological, natural, and other resources associated with the Meek Cutoff Study Trail. As part of the comparison of alternative routes in Segment 5, two tables provide quantification of trail resources in proximity to each alternative and route variation.

- Table 3-489 identifies the miles of the Meek Cutoff Study Trail alignment located in the study corridor for each alternative and route variation. Note, as previously mentioned, the Meek Cutoff Study Trail includes multiple alignments associated with the Hambleton and Ragen routes.
- Table 3-490 identifies the miles of the B2H Project located within 0.0 to 0.5 mile of trail-associated viewing locations (foreground distance zone) and 0.5 to 5 miles of trail-associated viewing locations (middleground distance zone).

Refer to map MV-26 for inventory data in context with B2H alternatives and route variations.

Table 3-489. Meek Cutoff Study Trail Inventory Data for Segment 5—Malheur

Alternative Route	Total Miles of Study Alignments in the Meek Cutoff Trail Study Area[1]
Applicant's Proposed Action	42.6
Variation S5-A1	*16.6*
Variation S5-A2	*16.6*
Variation S5-B1	*0.0*
Variation S5-B2	*0.0*
Malheur S	39.5
Malheur A	39.5

Table Note: [1]The total miles include both alignments of the trail under study by the NPS.

Table 3-490. Meek Cutoff Study Trail Viewing Location Inventory Data for Segment 5—Malheur

Alternative Route	Total Length (miles)	Extent of the B2H Project in Viewer Foreground (0.0 to 0.5 mile) Distance Zone	Extent of the B2H Project in Viewer Middleground (0.5 to 5.0 miles) Distance Zone
Applicant's Proposed Action	40.4	2.9	14.0
Variation S5-A1	*7.4*	*0.0*	*5.4*
Variation S5-A2	*7.4*	*0.0*	*3.1*
Variation S5-B1	2.5	0.0	0.0
Variation S5-B2	2.8	0.0	0.0
Malheur S	43.5	3.1	12.1
Malheur A	43.1	3.1	12.1

Applicant's Proposed Action Alternative

Trail Management

The NPS is studying two different alignments for the Meek Cutoff Study Trail identified as the (1) Ragen and (2) Hambleton routes to be added to the congressionally designated Oregon NHT. The two routes follow a similar alignment west of the community of Vale traveling westward with one route traveling through Malheur Canyon and the other climbing Vines Hill to the south.

Scenic and Recreation Resources

The setting adjacent to the Meek Cutoff Study Trail in the area west of Vale is characterized by the conversion of the lands adjacent to the Malheur River to irrigated agricultural uses with arid benchlands adjacent to the agricultural lands. Further to the west, the trail traverses Malheur Canyon with steep canyon walls with arid grassland and shrubland vegetation except for the narrow riparian corridor along the Malheur River. Other than an abandoned rail line, canal, and gravel and two-track roads, the canyon has limited apparent cultural modifications. West of the canyon, the Meek Cutoff Study Trail enters Little Valley which also has been largely converted to irrigated agricultural land uses.

No trail-associated recreation sites were identified in proximity to the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

Since the Meeks Cutoff Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Meek Cutoff Study Trail is primarily made up of a band of riparian vegetation along the Malheur River, including cottonwoods, with adjacent agricultural lands in the valleys and arid benchlands further away from the river corridor. Existing modifications in proximity to this portion of Meek Cutoff Study Trail include agricultural uses, gravel and two-track roads, a canal, and an abandoned railroad alignment.

Variation S5-A1

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The setting adjacent to the Meek Cutoff Study Trail in the area west of Vale is characterized by the conversion of the lands adjacent to the Malheur River to irrigated agricultural uses with arid benchlands adjacent to the agricultural lands. Further to the west, the trail traverses Malheur Canyon with steep canyon walls with arid grassland and shrubland vegetation except for the narrow riparian corridor along the Malheur River. Other than an abandoned rail line, canal, and gravel and two-track roads, the

canyon has limited apparent cultural modifications. West of the canyon, the Meek Cutoff Study Trail enters Little Valley which also has been largely converted to irrigated agricultural land uses.

No trail-associated recreation sites were identified in proximity to the variation.

Historic and Cultural Resources

Since the Meeks Cutoff Trail is currently under NPS feasibility study and has not been inventoried to the same extent as designed NHTs, no additional historic or cultural resource data are available for this trail.

Biological, Natural, and Other Resources

Vegetation along this portion of the Meek Cutoff Study Trail is primarily made up of a band of riparian vegetation along the Malheur River, including cottonwoods, with adjacent agricultural lands in the valleys and arid benchlands further away from the river corridor. Existing modifications in proximity to this portion of Meek Cutoff Study Trail include agricultural uses, gravel and two-track roads, a canal, and an abandoned railroad alignment.

Variation S5-A2

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as Variation S5-A1.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as Variation S5-A1.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as Variation S5-A1.

Variations S5-B1 and S5-B2

These variations are not located in proximity to the Meek Cutoff Study Trail.

Malheur S Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

Malheur A Alternative

Trail Management

The existing condition of environment relevant to trail management is the same as the Applicant's Proposed Action Alternative.

Scenic and Recreation Resources

The existing condition of environment relevant to scenic and recreation resources is the same as the Applicant's Proposed Action Alternative.

Historic and Cultural Resources

The existing condition of environment relevant to historic and cultural resources is the same as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

The existing condition of environment relevant to biological, natural, and other resources is the same as the Applicant's Proposed Action Alternative.

3.2.15.7 Environmental Consequences (Results of Analysis)

Types of Potential Effects

The construction, operation, and maintenance of the B2H Project would introduce short-term direct and indirect impacts on visual resources, recreational experiences, and historic and cultural settings. The Applicant's Proposed Action Alternative and the alternative routes and route variations would include short-term impacts, such as tower construction, line stringing, equipment operation, equipment/material transport, construction-related dust, and material stockpiling. These impacts would attract attention within the study corridor, resulting in short-term impacts on visual resources and historic and cultural settings. Ground-disturbing activities related to construction and access road development/improvement could result in long-term adverse impacts on NHT-associated historic and cultural resources, particularly those that are buried.

Once the transmission line has been constructed, the presence of large transmission towers potentially would introduce long-term direct impacts on visual resources and indirect impacts on recreational experiences and historic and cultural settings. Transmission line replacement/restringing, potential transmission tower replacement, ongoing vegetative clearing within the right-of-way, and routine transmission line maintenance (and associated vehicular access) could attract attention within the study

corridor. Auditory impacts associated with transmission line "buzzing" or "humming" also would detract from the remote sense of feeling contributing to the historic character of NHT resources.

Development of the B2H Project may also result in short-term and long-term indirect impacts. Vegetative clearings and permanent access roads would create opportunities for people to access previously inaccessible areas, which also could result in trampling of additional vegetation and additional impacts on trail-associated resources, such as increased erosion. Implementation of the B2H Project also would provide lands adjacent to the alignment with stronger connectivity to the power grid, which may result in increased energy development along the alignment. These indirect impacts could lower the scenic quality and further diminish the historic settings of the NHTs and Study Trails.

Increased use of existing and new or improved access roads also may lead to adverse impacts on cultural resources through increased artifact collection or looting, or both, and potential vandalism to historic and cultural sites and trail segments. Alternately, increased use of access roads indirectly could result in beneficial impacts on recreational resources because the new routes could provide and/or increase access to NHT-associated recreational resources. Recreational use of the trails also may decrease in areas where the scenic quality and historic setting are affected.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Applicant's right-of-way application to develop the B2H Project would not be approved. The B2H Project would not be developed and the environment will remain as it presently exists.

EFFECTS COMMON TO ALL ACTION ALTERNATIVES

Potential impacts on NHTs from geotechnical investigation activities largely would be avoided through implementation of design features of the B2H Project for environmental protection (refer to Table 2-7) and selective mitigation measures. Due to the intermittent nature and short duration of geotechnical investigation activities, impacts on NHTs would be minor to negligible. Geotechnical testing would be coordinated with the local BLM field office or managing agency. Overland travel in lands with wilderness characteristics would be avoided unless approved by the local BLM field office or management agency.

OREGON NATIONAL HISTORIC TRAIL

Segment 1—Morrow-Umatilla

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative and route variation. Six tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-491 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-492 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon

NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.

- Table 3-493 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-494 presents the information on visibility of the B2H Project associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- Table 3-495 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-496 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-491. Oregon National Historic Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Corridor (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	37.5	2.9	8.6	26.0
Variation S1-B1	*6.4*	*6.4*	*1.3*	*3.8*	*1.3*
Variation S1-B2	*6.4*	*6.4*	*5.6*	*0.8*	*0.0*
East of Bombing Range Road	92.3	37.8	2.3	9.2	26.3
Applicant's Proposed Action – Southern Route	99.1	37.5	2.9	8.6	26.0
West of Bombing Range Road – Southern Route	95.6	27.5	2.9	7.2	17.4
Longhorn	88.2	30.3	2.4	7.7	20.2
Interstate 84	84.7	49.2	5.2	27.4	16.6
Variation S1-A1	*18.5*	*18.5*	*3.9*	*12.5*	*2.1*
Variation S1-A2	*18.5*	*18.5*	*1.0*	*2.8*	*14.7*
Interstate 84 – Southern Route	93.4	49.0	5.2	27.4	16.6

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-492. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Potential Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	41.4	31.2	1
Variation S1-B1	*18.3*	*9.1*	*0*
Variation S1-B2	*18.3*	*10.7*	*0*
East of Bombing Range Road	41.5	31.2	1
Applicant's Proposed Action – Southern Route	41.4	31.2	1
West of Bombing Range Road – Southern Route	35.8	24.6	1
Longhorn	35.6	25.6	1
Interstate 84	56.0	40.8	1
Variation S1-A1	*26.2*	*19.2*	*1*
Variation S1-A2	*26.2*	*18.4*	*1*
Interstate 84 – Southern Route	56.0	40.8	1

Table 3-493. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 1—Morrow-Umatilla

Alternative Route	High Potential Historic Sites[1]						High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]	
	Well Spring	Echo Meadows	Echo Complex	Emigrant Springs	Meacham	Blue Mountain Crossing Interpretative Park	Boardman	Blue Mountains	Oregon Trail ACEC – California Gulch	Oregon Trail ACEC – Echo Meadows
Applicant's Proposed Action	No	–	–	No	No	No	Yes	No	No	–
Variation S1-B1	–	–	–	–	–	*No*	–	*No*	*No*	–
Variation S1-B2	–	–	–	–	–	*Yes*	–	*Yes*	*Yes*	–
East of Bombing Range Road	No	–	–	No	No	No	Yes	No	No	–
Applicant's Proposed Action – Southern Route	No	–	–	No	No	No	Yes	No	No	–
West of Bombing Range Road – Southern Route	No	–	–	No	No	No	Yes	No	No	–
Longhorn	–	–	–	No	No	No	No	No	No	–

Table 3-493. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 1—Morrow-Umatilla

Alternative Route	High Potential Historic Sites[1]						High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]	
	Well Spring	Echo Meadows	Echo Complex	Emigrant Springs	Meacham	Blue Mountain Crossing Interpretative Park	Boardman	Blue Mountains	Oregon Trail ACEC – California Gulch	Oregon Trail ACEC – Echo Meadows
Interstate 84	–	No	No	No	No	No	–	No	No	No
Variation S1-A1	–	–	*No*	–	–	–	–	–	–	–
Variation S1-A2	–	–	*No*	–	–	–	–	–	–	–
Interstate 84 – Southern Route	–	No	No	No	No	No	–	No	No	No

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-494. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	91.9	4.8	4.8	32.4	31.3
Variation S1-B1	*6.4*	*3.1*	*3.1*	*3.3*	*3.2*
Variation S1-B2	*6.4*	*4.9*	*4.9*	*1.5*	*1.5*
East of Bombing Range Road	92.3	4.1	4.1	33.4	32.3
Applicant's Proposed Action – Southern Route	99.1	4.8	4.8	32.4	31.3
West of Bombing Range Road – Southern Route	95.6	4.8	4.8	22.4	21.3
Longhorn	88.2	4.1	4.1	26.0	24.5
Interstate 84	84.7	28.0	28.0	21.0	19.9
Variation S1-A1	*18.5*	*15.4*	*15.3*	*3.2*	*3.2*
Variation S1-A2	*18.5*	*1.9*	*1.9*	*16.6*	*16.5*
Interstate 84 – Southern Route	93.4	28.0	28.0	21.0	19.9

Table 3-495. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 1—Morrow-Umatilla				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project
Applicant's Proposed Action	4.3	3.1	28.1	17.4
Variation S1-B1	*3.3*	*2.1*	*14.1*	*3.3*
Variation S1-B2	*5.1*	*5.1*	*12.3*	*3.5*
East of Bombing Range Road	4.4	3.1	28.2	17.5
Applicant's Proposed Action – Southern Route	4.3	3.1	28.1	17.5
West of Bombing Range Road – Southern Route	4.3	3.1	28.1	17.4
Longhorn	4.3	3.1	30.7	19.9
Interstate 84	34.8	33.5	34.7	21.9
Variation S1-A1	*15.7*	*15.7*	*10.3*	*7.9*
Variation S1-A2	*1.3*	*1.3*	*24.6*	*14.6*
Interstate 84 – Southern Route	34.8	33.5	34.7	21.9

Table 3-496. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 1—Morrow-Umatilla				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with Potential Views of the B2H Project	Miles of Contributing Trail Segments	Miles with Potential Views of the B2H Project
Applicant's Proposed Action	0.4	0.4	36.2	27.1
Variation S1-B1	*0.0*	*0.0*	*14.0*	*7.0*
Variation S1-B2	*0.5*	*0.5*	*14.0*	*7.3*
East of Bombing Range Road	0.4	0.4	36.4	27.3
Applicant's Proposed Action – Southern Route	0.4	0.4	36.2	27.1
West of Bombing Range Road – Southern Route	0.4	0.4	34.1	24.2
Longhorn	0.7	0.7	23.3	17.0
Interstate 84	0.4	0.4	22.7	15.7
Variation S1-A1	*0.4*	*0.4*	*2.7*	*1.9*
Variation S1-A2	*0.4*	*0.4*	*2.7*	*1.4*
Interstate 84 – Southern Route	0.4	0.4	22.7	15.7

Applicant's Proposed Action Alternative

Trail Management

High Potential Historic Route Segments. The Applicant's Proposed Action Alternative crosses the Boardman High Potential Route Segment on Link 1-27, west of Bombing Range Road, in an area with

existing transmission line development and irrigated agricultural lands. Due to the larger relative scale of the B2H Project, when compared to these existing modifications, the B2H Project would generate high impacts in the foreground distance zone from this trail management component. Due to topographic and vegetative screening, views from the Blue Mountain High Potential Route Segment would be moderately affected where the B2H Project is visible in context with an existing 230-kV transmission line and I-84.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the B2H Project due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting. Due to topographic and vegetative screening of the B2H Project and distance from the Emigrant Springs and Meacham High Potential Historic Sites, 4 miles and 2.75 miles respectively, views from these sites would be minimally affected by the B2H Project. Views from the Blue Mountain Crossing Interpretive Park would be influenced by the B2H Project (Link 1-77) and contrast produced would attract attention in context with the existing 230-kV transmission line and I-84 resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Applicant's Proposed Action Alternative crosses the NPS auto tour route, approximately 12 miles north of the congressional alignment (Link 1-3), outside of the trail-specific study corridor. Further to the east, in the Blue Mountains, the B2H Project would be located within 1.0 mile of the auto tour route for approximately 5 miles generating mostly moderate impacts, due to topographic and vegetative screening, except for a short section of high impacts on Link 1-77. These high impacts would result from unobstructed views of the B2H Project traversing steep forested terrain, in particular, views of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495.

Nature and Purpose. In two locations, the crossing of the Boardman High Potential Route Segment and where the B2H Project would be located within 0.5 mile of the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating views trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC – California Gulch portion. Impacts on views from Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resources located in the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. The Applicant's Proposed Action Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman and the Blue Mountains which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on trail-associated recreation sites including Wells Spring Interpretive Site (Visual Resource KOP #2-22) Emigrant Springs State Heritage Area (Visual Resource KOP #3-16), and Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are similar to those described for their corresponding high potential historic sites. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, one contributing trail segments (Well Spring Segment) would be crossed by the B2H Project (Link 1-27). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would be located adjacent to contributing segments associated with the Boardman and Blue Mountain High Potential Route Segments. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but due to the larger relative scale of the B2H Project, when compared to these existing modifications, the B2H Project would generate high impacts in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects. Views of the B2H Project (Link 1-77) from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be moderately affected due to views being partially screened by topography and vegetation and in context with an existing 230-kV transmission line and I-84. Selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads, would reduce these effects to the extent practicable. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project (Link 1-35) would be high and similar to the adjacent Boardman contributing trail segments. The views from the Emigrant Springs, Pioneer Burial and Monument, and Cemetery (near Meacham) trail-associated cultural sites would be minimally affected by the B2H Project due to topography and vegetative screening as described for the adjacent high potential historic sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman, narrow riparian vegetation corridors, and evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S1-B1

Trail Management

High Potential Historic Route Segments Views from the Blue Mountain High Potential Route Segment would be mostly screened by topography and vegetation and where the B2H Project (Link 1-77) would be visible, moderate impacts would occur in context with an existing 230-kV transmission line and I-84.

High Potential Historic Sites. Views from the Blue Mountain Crossing Interpretive Park would be influenced by the B2H Project and contrast produced would attract attention in context with the existing 230-kV transmission line and I-84 resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The B2H Project would be located within 1.0 mile of the NPS auto tour route for approximately 5 miles generating mostly moderate impacts, due to topographic and vegetative screening, except for a short section of high impacts (Link 1-77). These high impacts would result from unobstructed views of the B2H Project traversing steep forested terrain, in particular, views of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these

impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495

Nature and Purpose. In the area where the B2H Project would be located within 0.5 mile of the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Similar to the Applicant's Proposed Action Alternative, Variation S1-B1 does not cross the Oregon Trail ACEC – California Gulch portion. Impacts on views from Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resource located in the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Similar to the Applicant's Proposed Action Alternative, Variation S1-B1 does not cross any Oregon NHT trail segments. Variation S1-B1 is not located in the USFS Oregon NHT Visual Corridor (0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

If Variation S1-B1 is selected, the addition of the B2H Project would modify the trail setting in the Blue Mountains, which have already been influenced by existing development including existing utilities and I-84. The application of selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route and Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are described above in the Trail Management section. The overall extent of the B2H Project visible within the foreground and middleground distance zones, from all trail-associated viewing locations, is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. If Variation S1-B1 is selected, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. Views of the B2H Project from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be moderately affected due to views being partially screened by topography and vegetation and in context with an existing 230-kV transmission line and I-84. Selective mitigation measures to minimize of vegetation clearing in the right-of-way and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

If Variation S1-B1 is selected, the B2H Project would modify evergreen forests in the Blue Mountains associated with the Oregon NHT through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce these effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S1-B2

Trail Management

High Potential Historic Route Segments. If Variation S1-B2 is selected, views from the Blue Mountain High Potential Route Segment would be partially screened by vegetation but where the B2H Project would be visible (Link 1-75), high impacts would occur at the edge of the foreground distance zone from a superior viewing position which would increase visibility of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level.

High Potential Historic Sites. Views from the Blue Mountain Crossing Interpretive Park also would be partially screened by vegetation but where the B2H Project would be visible (Link 1-75), the B2H Project would dominate views resulting in high impacts. Similar selective mitigation measures would be applied as discussed for the Blue Mountain High Potential Route Segment.

Auto Tour Routes. Variation S1-B2 crosses the NPS auto tour route twice and parallels the interstate for approximately 3 miles between these crossings within the foreground distance zone. An existing 230-kV transmission line is located adjacent to the B2H Project alignment but due to the relative scale of the B2H Project, it would be more visible above the trees in this forested landscape than the existing transmission line resulting in high impacts on these views. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495.

Nature and Purpose. The area of high impacts on views from the Blue Mountain High Potential Route Segment, Oregon Trail ACEC – California Gulch, Blue Mountain Crossing Interpretive Park, and the NPS auto tour route would compromise the trail's nature and purpose by dominating views trail management components. Due to these impacts, additional compensatory mitigation would be required

to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The B2H Project would not cross the Oregon Trail ACEC – California Gulch portion. Impacts on views from Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resource located in the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. The B2H Project would not cross any Oregon NHT trail segments or be located in the USFS Oregon NHT Visual Corridor (0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

If Variation S1-B2 is selected, the addition of the B2H Project would modify the trail setting in the Blue Mountains, which have already been influenced by existing development including existing utilities and I-84. The application of selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route and Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are described above in the Trail Management section. The overall extent of the B2H Project visible within the foreground and middleground distance zones, from all trail-associated viewing locations, is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. If Variation S1-B2 is selected, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. Views of the B2H Project from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be highly affected where the B2H Project would be visible in grassland meadows due to the superior viewing position, which would increase visibility of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

If Variation S1-B2 is selected, the B2H Project would modify evergreen forests in the Blue Mountains associated with the Oregon NHT through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce these effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would cross the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the foreground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the additional action due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for their corresponding high potential historic sites.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action,

moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 2

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 3

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away including the proposed step-down substation. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction and siting the step-down substation to minimize visibility from the Oregon NHT, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

East of Bombing Range Road Alternative

Impacts on the Oregon NHT are the same as the Applicant's Proposed Action Alternative except for the portion along Bombing Range Road. Along Bombing Range Road, the East of Bombing Range Road Alternative is located further to the east (Link 1-25) where the existing transmission line (west of Bombing Range Road) would be located closer to the contributing trail traces, associated with the Boardman High Potential Historic Segment, which would reduce the relative dominance of the B2H Project on views in this area. Note, this alternative crosses the same contributing trail segment

discussed under the Applicant's Proposed Action Alternative. Additionally, this alternative route is located farther (Link 1-33) from the Sand Hollow Battlefield 1848 reducing the B2H Project's influence on this trail-associated cultural site.

Applicant's Proposed Action – Southern Route Alternative

Impacts on the Oregon NHT are the same as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to the Oregon NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would cross the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the foreground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the additional action due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for their corresponding high potential historic sites.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated

agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 2

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 3

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away including the proposed step-down substation. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction and siting the step-down substation to minimize visibility from the Oregon NHT, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

West of Bombing Range Road – Southern Route Alternative

Impacts on the Oregon NHT are the same as the Applicant's Proposed Action Alternative, since the two alternatives share the same alignment in proximity to the Oregon NHT, except the West of Bombing

Range Road – Southern Route Alternative exits the trail-specific study corridor by continuing further to the south, minimizing any potential impacts on the general setting for the Oregon NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Option 1

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would cross the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the foreground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be minimally affected by the additional action due to the extent of existing modifications adjacent to Bombing Range Road and the viewing distance, approximately 4 miles away, which would generate a low level of visual contrast in this setting.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for their corresponding high potential historic sites.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be low in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 2

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation

measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Design Option 3

Trail Management

High Potential Historic Route Segments. Under the additional action, the B2H Project would be located within 1.0 mile of the Boardman High Potential Route Segment, east of Bombing Range Road, in an area with existing transmission line development and irrigated agricultural lands. The additional action would be similar in scale to these existing modifications and additional action would generate moderate impacts in the middleground distance zone from this trail management component.

High Potential Historic Sites. Views from the Well Spring High Potential Historic Site would be moderately affected by the additional action located approximately 2 miles away including the proposed step-down substation. The site would view the Connection Action head-on resulting in an increase in visual contrast as the proposed transmission line structures would line up generating a more dominant feature in the site's viewshed than if the views were perpendicular to the additional action.

Nature and Purpose. Through the application of selective mitigation measures, including the use of overland construction and siting the step-down substation to minimize visibility from the Oregon NHT, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under the additional action, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman, which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain would reduce these effects to the extent practicable.

Impacts on the trail-associated recreation sites, Wells Spring Interpretive Site (Visual Resource KOP #2-22), are similar to those described for the corresponding high potential historic site.

Historic and Cultural Resources

Contributing Trail Segments. One contributing trail segment (Well Spring Segment) would be crossed by the additional action. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the additional action would be located adjacent to contributing segments associated with the Boardman High Potential Route Segment. The contributing segments near the Boardman High Potential Route Segment have had their viewsheds modified by existing transmission line development and irrigated agricultural lands but since the existing modification are similar in scale to the additional action, moderate impacts would occur in the foreground distance zone. Due to the constrained routing through this area between irrigated agricultural lands and the NWSTF Boardman, there are limited opportunities to effectively mitigate these effects.

Trail-associated Cultural Sites. Impacts on views from Upper Well Spring, Well Spring Pioneer Campsite, and Well Spring Pioneer Cemetery would be moderate in magnitude and similar to those described for the Well Spring High Potential Historic Site and interpretive site. Impacts on the Sand Hollow Battlefield 1848 trail-associated cultural site resulting from the B2H Project would be moderate and similar to the adjacent Boardman contributing trail segments.

Biological, Natural, and Other Resources

The additional action would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Longhorn Alternative

Impacts on the Oregon NHT are the same as the Applicant's Proposed Action Alternative except for the area in proximity to the Boardman High Potential Historic Segment. The Longhorn Alternative does not cross the high potential historic segment but does cross a contributing trail segment in an area with a more intact setting except for irrigated and dryland agricultural uses (Link 1-15). The Longhorn Alternative would generate higher visual contrast when compared to the Applicant's Proposed Action

Alternative. Low impacts would occur on views from the Sand Hollow Battlefield 1848 trail-associated cultural site since this alternative route is located more than 4 miles away from the site.

Interstate 84 Alternative

Trail Management

High Potential Historic Route Segments. The Interstate 84 Alternative does not cross the Boardman High Potential Route Segment. Due to topographic and vegetative screening, views from the Blue Mountain High Potential Route Segment would be moderately affected where the B2H Project is visible in context with an existing 230-kV transmission line and I-84.

High Potential Historic Sites. Views from the Echo Meadows High Potential Historic Site (located in the Oregon Trail ACEC- Echo Meadows portion) would be minimally affected by the B2H Project due to the extent of irrigated agricultural development, including center pivots, and the B2H Project being located approximately 4 miles away. The area adjacent to the Echo Complex High Potential Historic Site has been developed into a community since the trail's period of use and dominates the adjacent setting. In areas where views of this development may be screened from view, such as the area adjacent to the Umatilla River, the B2H Project would attract attention of viewers but would not dominate the viewshed as an existing 230-kV transmission line is located east of the community of Echo and I-84 runs adjacent to the B2H Project. Due to topographic and vegetative screening of the B2H Project and distance from the Emigrant Springs and Meacham High Potential Historic Sites, 4 miles and 2.75 miles respectively, views from these sites would be minimally affected by the B2H Project. Views from the Blue Mountain Crossing Interpretive Park would be influenced by the B2H Project (Link 1-77) and contrast produced would attract attention in context with the existing 230-kV transmission line and I-84 resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Interstate 84 Alternative parallels the NPS auto tour route (I-84) for approximately 25 miles west of Pendleton within the trail-specific study corridor generating mostly moderate impacts due to the Oregon NHT being located more than 3 miles south of the interstate in a landscape influenced by irrigated agricultural uses and center pivots. Approximately 5 miles west of Pendleton, the Oregon NHT is located adjacent to the interstate in an area with less visual influence from mechanized agricultural use, and due to the dominance of the B2H Project (Link 1-31) in this setting, high impacts would occur on this segment of the NPS auto tour route. Further to the east, in the Blue Mountains, the B2H Project would be located within 1.0 mile of the auto tour route for approximately 5 miles generating mostly moderate impacts, due to topographic and vegetative screening, except for a short section of high impacts (Link 1-77). These high impacts would result from unobstructed views of the B2H Project traversing steep forested terrain, in particular, views of the geometrically shaped cleared right-of-way. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-495.

Nature and Purpose. In two locations along the NPS auto tour route, (1) west of Pendleton where the Oregon NHT crosses the auto tour route where the B2H Project is located parallel to the route and (2) where the B2H Project would be located within 0.5 mile of the auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Interstate 84 Alternative does not cross the Oregon Trail ACEC – Echo Meadows or California Gulch portions. Impacts on views from the Echo Meadows High Potential Historic Site and contributing trail segments, trail-associated resources located in the Echo Meadows portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from the Blue Mountain High Potential Route Segment and contributing trail segments, trail-associated resources located in the California Gulch portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. The Interstate 84 Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (0.25-mile buffer from the Blue Mountains trail segment).

Variation S1-A1 would have similar impacts on trail management for the Oregon NHT as the Interstate 84 Alternative.

Variation S1-A2 would have similar impacts as the Interstate 84 Alternative on the high potential historic sites except for Echo Complex High Potential Historic Site which would potentially have a wider area viewed as modified when compared to the Interstate 84 Alternative as this variation (Link 1-37) parallels an existing 230-kV transmission line one mile northeast of Echo. This variation would have reduced impacts on the NPS auto tour route since I-84 would be paralleled for approximately 10 miles instead of 25 miles on the Interstate 84 Alternative including avoiding the area of high impacts west of Pendleton.

Scenic and Recreation Resources

Under the Interstate 84 Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the level to rolling plains south of Boardman and the Blue Mountains which have already been influenced by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section.

Additionally impacts on trail-associated recreation sites including Echo Meadow Interpretive Site (Visual Resource KOP #3-27), Emigrant Springs State Heritage Area (Visual Resource KOP #3-16), and

Oregon Trail Interpretive Park Picnic Area (Blue Mountain Crossing Interpretive Park) (Visual Resource KOP #4-32) are similar to those described for their corresponding high potential historic sites.

Variations S1-A1 and S1-A2 would have similar impacts on scenic and recreation resources for the Oregon NHT as the Interstate 84 Alternative. The overall extent of the B2H Project visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-494.

Historic and Cultural Resources

Contributing Trail Segments. Under the Interstate 84 Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments near the NPS auto tour route(Link 1-31). The contributing segments near the NPS auto tour route have had their viewsheds modified by the interstate highway and agricultural land uses but due to the larger relative scale of the B2H Project, when compared to these existing modifications, the B2H Project would generate high impacts in the foreground distance zone. Since this alternative route was developed to parallel existing linear facilities, I-84, and the terrain is not conducive to screen views of the transmission line towers, there are limited opportunities to effectively mitigate these effects along this alignment. Views of the B2H Project from contributing trail segments associated with the Blue Mountain High Potential Route Segment, including those in the Oregon Trail ACEC – California Gulch portion (Inventory Observation Point 1-2), would be moderately affected due to views being partially screened by topography and vegetation and in context with an existing 230-kV transmission line and I-84. Selective mitigation measures to minimize vegetation clearing in the right-of-way and limit earthwork associated with the construction of access roads, would reduce these effects to the extent practicable. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496.

Trail-associated Cultural Sites. Impacts on views from the Ewing Crossing and Echo Meadows trail-associated cultural sites would be low in magnitude and similar to those described for the Echo Meadows High Potential Historic Site. Views of the B2H Project from the Echo-Pioneer Campsite, Possible Fort Henrietta, and Echo-Indian Agent Home trail-associated cultural sites are similar to those described for the Echo Complex High Potential Historic Site. Impacts on views from the Meeker Monument in Pendleton, trail-associated cultural site, would be minimal due to the adjacent urban development and distance from the B2H Project, approximately 4 miles. The views from the Emigrant Springs, Pioneer Burial and Monument, and Cemetery (near Meacham) trail-associated cultural sites would be minimally affected by the B2H Project due to topography and vegetative screening as described for the adjacent high potential historic sites. The B2H Project would have minimal effects on the Stage Station near Pack Rat Spring due to topographic and vegetative screening. Views from the Campsite (near California Gulch) also would be minimally affected due to views of the B2H Project being screened and the existing viewshed has been modified by an existing 230-kV transmission line and I-84 in the immediate foreground. Impacts on the Blue Mountain Crossing Interpretive Park trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Variation S1-A1 would have similar impacts on historic and cultural resources for the Oregon NHT as the Interstate 84 Alternative.

Variation S1-A2 would have similar impacts on historic and cultural resources for the Oregon NHT as the Interstate 84 Alternative except this variation would generate high impacts on views from a contributing trail trace northwest of the community of Nolin (Link 1-37) in an area not modified by agricultural practices. Even though this variation parallels an existing 230-kV transmission line, the relative scale of the B2H Project compared to this existing line, the B2H Project would dominate views within the foreground distance zone of this trail resource. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-496. Views of this variation from the Echo-Pioneer Campsite, Possible Fort Henrietta, and Echo-Indian Agent Home trail-associated cultural sites are similar to those described for the Echo Complex High Potential Historic Site.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Boardman, narrow riparian vegetation corridors, and evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variations S1-A1 and S1-A2 would have similar impacts on biological, natural, and other resources for the Oregon NHT as the Interstate 84 Alternative.

Interstate 84 – Southern Route Alternative

Impacts on the Oregon NHT are the same as the Interstate 84 Alternative since the two alternatives share the same alignment in proximity to the Oregon NHT.

Conclusions

The Longhorn Alternative would have the lowest overall impacts on the Oregon NHT including trail management components as the Boardman high potential route segment would not be crossed and the NPS auto tour route would not be paralleled west of Pendleton. The alternatives along Bombing Range Road (Applicant's Proposed Action Alternative, East of Bombing Range Road, Applicant's Proposed Action – Southern Route, and West of Bombing Range Road – Southern Route) would highly impact the Boardman high potential route segment and cross a contributing trail segment (Well Spring Segment). The Interstate 84 and Interstate 84 – Southern Route alternatives would highly impact views from the NPS auto tour route west of Pendleton where the auto tour route is paralleled. Variation S1-B2 would highly impact views from the Blue Mountain high potential route segment, adjacent contributing trail segments, the Blue Mountain Crossing Interpretative Park high potential historic site, and the Oregon Trail ACEC – California Gulch portion whereas Variation S1-B1 would moderately impact these trail components. All alternatives would require compensatory mitigation for high impacts on views from the NPS auto tour route with the routes along Bombing Range Road also requiring compensatory

mitigation for high impacts on the Boardman high potential route segment. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 2—Blue Mountains

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Six tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-497 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-498 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-499 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-500 presents the information on visibility of the B2H Project associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- Table 3-501 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-502 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-497. Oregon National Historic Trail Summary of Residual Impacts for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	33.8	33.8	9.7	11.4	12.7
Variation S2-A1	*2.8*	*2.8*	*2.4*	*0.4*	*0.0*
Variation S2-A2	*2.9*	*2.9*	*0.1*	*2.8*	*0.0*
Variation S2-B1	*3.7*	*3.7*	*2.2*	*1.5*	*0.0*
Variation S2-B2	*3.8*	*3.8*	*0.7*	*3.1*	*0.0*
Variation S2-C1	*9.3*	*9.3*	*0.0*	*2.4*	*6.9*
Variation S2-C2	*8.8*	*8.8*	*0.0*	*3.4*	*5.4*
Variation S2-E1	*2.3*	*2.3*	*0.9*	*1.4*	*0.0*

Table 3-497. Oregon National Historic Trail Summary of Residual Impacts for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Variation S2-E2	*2.6*	*2.6*	*1.4*	*1.2*	*0.0*
Variation S2-F1	*12.1*	*12.1*	*4.0*	*2.4*	*5.7*
Variation S2-F2	*12.2*	*12.2*	*1.8*	*3.9*	*6.5*
Glass Hill	33.7	33.7	9.6	9.2	14.9
Variation S2-D1	*4.3*	*4.3*	*0.0*	*0.0*	*4.3*
Variation S2-D2	*4.1*	*4.1*	*0.0*	*0.0*	*4.1*
Mill Creek	34.0	34.0	9.5	18.0	6.5

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-498. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 2—Blue Mountains

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	45.7	34.6	1
Variation S2-A1	*13.9*	*8.1*	*0*
Variation S2-A2	*13.9*	*6.6*	*0*
Variation S2-B1	*14.6*	*4.7*	*0*
Variation S2-B2	*14.6*	*5.9*	*0*
Variation S2-C1	*22.6*	*10.6*	*0*
Variation S2-C2	*22.6*	*14.6*	*0*
Variation S2-E1	*11.9*	*7.1*	*0*
Variation S2-E2	*11.9*	*7.0*	*0*
Variation S2-F1	*21.3*	*16.4*	*1*
Variation S2-F2	*21.2*	*17.4*	*1*
Glass Hill	45.7	32.9	1
Variation S2-D1	*14.4*	*0.7*	*0*
Variation S2-D2	*12.5*	*0.4*	*0*
Mill Creek	45.6	41.0	1

Table 3-499. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 2—Blue Mountains

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]		Areas of Critical Environmental Concern[1]
	Hilgard Junction	Blue Mountains	Ladd Canyon	
Applicant's Proposed Action	No	No	No	None
Variation S2-A1	*No*	*No*	*–*	*None*
Variation S2-A2	*No*	*No*	*–*	*None*
Variation S2-B1	*No*	*No*	*–*	*None*
Variation S2-B2	*No*	*No*	*–*	*None*
Variation S2-C1	*No*	*No*	*–*	*None*
Variation S2-C2	*No*	*No*	*–*	*None*
Variation S2-E1	*–*	*–*	*No*	*None*
Variation S2-E2	*–*	*–*	*No*	*None*
Variation S2-F1	*–*	*–*	*No*	*None*
Variation S2-F2	*–*	*–*	*No*	*None*
Glass Hill	No	No	No	None
Variation S2-D1	*–*	*No*	*–*	*None*
Variation S2-D2	*–*	*No*	*–*	*None*
Mill Creek	No	Yes	No	None

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-500. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	33.8	5.6	5.6	28.0	24.4
Variation S2-A1	*2.8*	*2.5*	*2.5*	*0.4*	*0.3*
Variation S2-A2	*2.9*	*0.3*	*0.3*	*2.6*	*2.6*
Variation S2-B1	*3.7*	*1.0*	*1.0*	*2.6*	*2.5*
Variation S2-B2	*3.8*	*0.1*	*0.1*	*3.7*	*3.6*
Variation S2-C1	*9.3*	*0.0*	*0.0*	*9.3*	*6.4*
Variation S2-C2	*8.8*	*0.0*	*0.0*	*8.8*	*8.8*
Variation S2-E1	*2.3*	*0.0*	*0.0*	*2.3*	*2.3*
Variation S2-E2	*2.6*	*0.6*	*0.6*	*2.0*	*2.0*
Variation S2-F1	*12.1*	*2.1*	*2.1*	*9.9*	*9.7*
Variation S2-F2	*12.2*	*1.7*	*1.7*	*10.5*	*10.3*

Table 3-500. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 2—Blue Mountains

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Glass Hill	33.7	5.5	5.5	28.1	24.3
Variation S2-D1	*4.3*	*0.0*	*0.0*	*4.3*	*2.4*
Variation S2-D2	*4.1*	*0.0*	*0.0*	*4.1*	*1.2*
Mill Creek	34.0	*8.5*	8.5	25.5	25.4

Table 3-501. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 2—Blue Mountains

Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Applicant's Proposed Action	5.4	4.9	42.7	23.2
Variation S2-A1	*3.7*	*2.2*	*10.1*	*4.1*
Variation S2-A2	*0.8*	*0.8*	*13.1*	*3.9*
Variation S2-B1	*0.0*	*0.0*	*14.8*	*3.5*
Variation S2-B2	*0.0*	*0.0*	*14.8*	*3.1*
Variation S2-C1	*0.0*	*0.0*	*24.6*	*6.4*
Variation S2-C2	*0.0*	*0.0*	*24.6*	*13.5*
Variation S2-E1	*0.0*	*0.0*	*14.1*	*6.9*
Variation S2-E2	*1.4*	*1.4*	*12.7*	*5.7*
Variation S2-F1	*1.6*	*1.6*	*21.1*	*13.1*
Variation S2-F2	*1.7*	*1.7*	*21.0*	*13.2*
Glass Hill	5.4	3.9	36.2	23.2
Variation S2-D1	*0.0*	*0.0*	*7.2*	*0.0*
Variation S2-D2	*0.0*	*0.0*	*7.0*	*0.0*
Mill Creek	6.4	6.3	41.7	31.7

Table 3-502. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 2—Blue Mountains

Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Applicant's Proposed Action	0.6	0.6	20.4	13.4
Variation S2-A1	*0.0*	*0.0*	*12.8*	*6.6*
Variation S2-A2	*0.0*	*0.0*	*12.8*	*5.6*

Table 3-502. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 2—Blue Mountains

Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Variation S2-B1	*0.0*	*0.0*	*11.1*	*2.7*
Variation S2-B2	*0.2*	*0.2*	*10.9*	*3.8*
Variation S2-C1	*0.0*	*0.0*	*10.9*	*5.4*
Variation S2-C2	*0.0*	*0.0*	*10.9*	*7.1*
Variation S2-E1	*0.0*	*0.0*	*4.1*	*2.6*
Variation S2-E2	*0.0*	*0.0*	*4.1*	*2.6*
Variation S2-F1	*0.6*	*0.6*	*5.1*	*2.9*
Variation S2-F2	*0.4*	*0.4*	*5.3*	*3.3*
Glass Hill	0.6	0.6	20.4	11.5
Variation S2-D1	*0.0*	*0.0*	*5.8*	*1.2*
Variation S2-D2	*0.0*	*0.0*	*5.0*	*0.9*
Mill Creek	4.0	3.9	17.0	12.3

Applicant's Proposed Action

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along the Applicant's Proposed Action Alternative, moderate impacts would occur as the existing 230-kV transmission line would be screened from view with I-84 located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Closer to the community of La Grande, views of the B2H Project from the Blue Mountain High Potential Route Segment in context with an existing 230-kV transmission line would be partially screened by topography and vegetation and occur beyond the foreground distance zone (0 to 0.5 mile) resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-20) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and

vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Applicant's Proposed Action Alternative is located in proximity to the NPS auto tour route in two locations, (1) adjacent to Hilgard Junction and (2) south of Ladd Canyon. Views of the B2H Project (Link 2-5) from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile), where the B2H Project is located closer to the highway than the existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. South of Ladd Canyon, the NPS auto tour route would have views of the B2H Project traversing steep forested terrain within 1 mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project (Link 2-75). An existing 230-kV transmission line is located in the vicinity of the Applicant's Proposed Action Alternative but is located more than 0.5 mile away and due to the relative scale of the B2H Project, the introduction of the proposed transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. The Applicant's Proposed Action Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the Blue Mountains west of La Grande and the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are

similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain and Ladd Canyon High Potential Route Segments as well as the NPS auto tour route. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. The contributing trail segments closer to La Grande are not located adjacent to I-84 but have been visually influenced by an existing 230-kV transmission line. Views of the B2H Project from these trail segments would occur in the middleground distance zone, partially screened by topography and vegetation resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project. Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-35) as transmission line structures and construction access roads would be constructed within 1,000 feet of these sites in an area with limited cultural modifications. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Views from Emily Doone Grave 1868 would be moderately affected by the B2H Project (Link 2-35) as the setting has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation. Due to the level of existing development in and adjacent to La Grande as well as the viewing distance, more than 3 miles away, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the

B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Creek), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project, 2.5 miles away in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, grassland and shrubland dominated landscapes north of the community of North Powder, and narrow riparian vegetation corridors, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-A1

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along this variation, moderate impacts would occur as the existing 230-kV transmission line would be screened from view with I-84 located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-20) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening of these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. Views of the B2H Project (Link 2-5) from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile) in context with the

existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. This variation does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under Variation S2-A1, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which have been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-A1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would

be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-A2

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project (Link 2-7) would be visible along the this variation, moderate impacts would occur as I-84 is located between the trail segment and the B2H Project and the existing 230-kV transmission line would be screened from view due to its lower height. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-10) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening of these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. Views of the B2H Project from the NPS auto tour route north of Hilgard Junction would be moderately affected within the middleground distance zone (0.5 to 5 miles), where the B2H Project is located further away than the existing 230-kV transmission line, with views intermittently screened by vegetation. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. Through the application of selective mitigation measures, including minimizing vegetation clearing and routing construction access roads to minimize earthwork, the intended experience of the trail would be affected but not substantially compromised.

Other Trail Management Areas. Variation S2-A2 does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under Variation S2-A2, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which have been modified by existing

development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-501.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-A2, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segment. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84 and an existing 230-kV transmission line. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-B1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project (Link 2-35) from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation and occur in the middleground distance zone (0.5 to 5 miles) in context with an existing 230-kV transmission line resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project and contrast produced would attract attention in context with the existing

230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. Views of the B2H Project from the NPS auto tour route south of Hilgard Junction would be moderately affected as views would be intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would be co-dominate with the existing 230-kV transmission line located closer to the auto tour route. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. Through the application of selective mitigation measures, including minimizing vegetation clearing and routing construction access roads to minimize earthwork, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under Variation S2-B1, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which has been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-B1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segments. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected in the middleground distance zone due to views of the B2H Project (Link 2-35) being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with an existing 230-kV transmission line. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from

the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-35) as transmission line structures and construction access roads would be constructed within 1,000 feet of these sites in an area with limited cultural modifications. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Views from Emily Doone Grave 1868 would be moderately affected by the B2H Project as the setting has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-B2

Trail Management

Impacts on trail management are similar to Variation S2-B1 except Variation S2-B2 (Link 2-25) would be located closer to Hilgard Junction High Potential Historic Site, Blue Mountain High Potential Route Segment, and NPS auto tour route, but adjacent to the existing 230-kV transmission line, resulting in a similar level of effects

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-B1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-B1 except views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-25) for a shorter duration as transmission line structures and construction access roads would be constructed within 0.5 mile of these sites, compared to within 1000 feet, in an area with limited cultural modifications.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-B1 since both variations traverse similar landscapes.

Variation S2-C1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project (Link 2-45) from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation and

occur in the middleground distance zone (0.5 to 5 miles) in context with an existing 230-kV transmission line resulting in moderate impacts. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Auto Tour Routes. Views of the B2H Project from the NPS auto tour route south of Hilgard Junction would be moderately affected as views would be intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would be co-dominate with the existing 230-kV transmission line located closer to the auto tour route. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. Through the application of selective mitigation measures, including minimizing vegetation clearing and routing construction access roads to minimize earthwork, the intended experience of the trail would be affected but not substantially compromised.

Scenic and Recreation Resources

Under Variation S2-C1, the addition of the B2H Project would modify the trail setting in the typical landscape setting in the Blue Mountains west of La Grande which has been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads in mountainous terrain, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-C1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain High Potential Route Segments. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected in the middleground distance zone due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with an existing 230-kV transmission line. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from Emily Doone Grave 1868 would be moderately affected by the B2H Project (Link 2-35) as the setting

has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation. Due to the level of existing development in and adjacent to La Grande as well as the viewing distance, more than 3 miles away, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Canyon), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project, 2.5 miles away in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills southwest of La Grande, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-C2

Trail Management

Impacts on trail management are similar to Variation S2-C1 since both variations are located in proximity to each other, and in similar settings, near the Blue Mountain High Potential Route Segment and NPS auto tour route.

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-C1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-C1 since both variations are located in proximity to each other, and in similar settings, near contributing trail segments and trail-associated cultural sites.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-C1 since both variations traverse similar landscapes.

Variation S2-E1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project (Link 2-60) from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

Auto Tour Routes. Variation S2-E1 is located in proximity to the NPS auto tour route south of Ladd Canyon. The NPS auto tour route would have views of the B2H Project (Link 2-60) traversing steep forested terrain within one mile of I-84 adjacent to an existing 230-kV, but due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under Variation S2-E1, the addition of the B2H Project would modify the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities and I-84. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-E1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Ladd Canyon High Potential Route Segment. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

Trail-associated Cultural Sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project (Link 2-60) would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes north of the community of North Powder, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-E2

Trail Management

Impacts on trail management are similar to Variation S2-E1 since both variations are located in proximity to each other, and in similar settings, near the Ladd Canyon High Potential Route Segment and NPS auto tour route.

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-E1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-E1 except Variation S2-E2 (Link 2-55) would be located within 1.0 mile of contributing trail segments associated with the Ladd Canyon High Potential Historic Segment resulting in high impacts on the setting. An existing 230-kV transmission line and I-84 are located in proximity to the trail segment, but due to the relative scale of the B2H Project, the introduction of transmission line structures would dominate the setting.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-E1 since both variations traverse similar landscapes.

Variation S2-F1

Trail Management

High Potential Historic Route Segments. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

Auto Tour Routes. Variation S2-F1 is located in proximity to the NPS auto tour route south of Ladd Canyon. The NPS auto tour route would have views of the B2H Project traversing steep forested terrain within one mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project (Link 2-75). An existing 230-kV transmission line is located in the vicinity of the Applicant's Proposed Action Alternative but is located more than 0.5 mile away and due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to

minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep forested terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under Variation S2-F1, the addition of the B2H Project would modify the trail setting in the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S2-F1, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the NPS auto tour route. Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including, grassland and shrubland dominated landscapes north of the community of North Powder, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-F2

Trail Management

Impacts on trail management are similar to Variation S2-F1 except the B2H Project would be located adjacent to the existing 230-kV transmission line where the NPS auto tour route is crossed (Link 2-70). The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-F1 since both variations traverse similar landscape settings.

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-F1 except Variation S2-F2 (Link 2-70) would be located adjacent to the existing 230-kV transmission line in proximity to the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder. The application of selective mitigation measures to use overland construction techniques where possible and route construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-F1 since both variations traverse similar landscapes.

Glass Hill Alternative

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along the Glass Hill Alternative, moderate impacts would occur as the existing 230-kV

transmission line would be screened from view with I-84 located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-20) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Glass Hill Alternative is located in proximity to the NPS auto tour route in two locations, (1) adjacent to Hilgard Junction and (2) south of Ladd Canyon. Views of the B2H Project (Link 2-5) from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile), where the B2H Project is located closer than the existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. South of Ladd Canyon, the NPS auto tour route would have views of the B2H Project (Link 2-75) traversing steep forested terrain within one mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project. An existing 230-kV transmission line is located in the vicinity of the Glass Hill Alternative but is located more than 0.5 mile away and due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the NPS auto tour route in steep terrain, the B2H Project would compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. The Glass Hill Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Glass Hill Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the Blue Mountains west of La Grande and the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under the Glass Hill Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain and Ladd Canyon High Potential Route Segments as well as the NPS auto tour route. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be minimally affected due to the distance, more than 2 miles away, with I-84 and an existing 230-kV transmission line located between the trail segment and the B2H Project. Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and route construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be highly affected by the B2H Project (Link 2-40) as transmission line structures and construction access roads would be constructed within 1,000 feet of these sites in an area with limited cultural modifications. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Views from Emily Doone Grave 1868 would be minimally affected by

the B2H Project as the setting has been modified by an existing 230-kV transmission line located closer to the trail-associated cultural site and views of the B2H Project would be partially screened by topography and vegetation. Due to the level of existing development in and adjacent to La Grande as well as the viewing distance, more than 5 miles away, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Canyon), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project, 2.5 miles away in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project (Link 2-75) as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, grassland and shrubland dominated landscapes north of the community of North Powder, and narrow riparian vegetation corridors, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variation S2-D1

Trail Management

Views from the Blue Mountain High Potential Route Segment and NPS auto tour route would be minimally affected by this variation as the B2H Project would be located approximately 5 miles away with views screened by terrain. No high potential historic sites are located in the study corridor. This variation would not compromise the trail's nature and purpose.

Scenic and Recreation Resources

Under Variation S2-D1, the addition of the B2H Project would minimally affect the trail setting as the Oregon NHT is located approximately 5 miles away and the B2H Project would traverse landscapes not in proximity to the NHT. Impacts on the NPS auto tour route are described above in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground

and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Under Variation S2-D1, low impacts on contributing trail segments and trail-associated sites, including their settings, would occur as these historic and cultural resources are located more than 4 miles away with views of the B2H Project screened by topography and vegetation.

Biological, Natural, and Other Resources

Under Variation S2-D1, the addition of the B2H Project would minimally affect characteristic vegetation communities associated with the Oregon NHT as the B2H Project is located approximately 5 miles away and would traverse landscapes not in proximity to the NHT.

Variation S2-D2

Trail Management

Impacts on trail management are similar to Variation S2-D1 since views of both variations are screened by terrain and located approximately 5 miles away from the Blue Mountain High Potential Route Segment and NPS auto tour route.

Scenic and Recreation Resources

Impacts on scenic and recreation resources are similar to Variation S2-D1 since both variations traverse similar landscape settings

Historic and Cultural Resources

Impacts on historic and cultural resource are similar to Variation S2-D1 since views of both variations are screened by terrain and located approximately 4 miles away from contributing trail segments and trail-associated sites..

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources are similar to Variation S2-D1 since both variations traverse similar landscapes..

Mill Creek Alternative

Trail Management

High Potential Historic Route Segments. Views from the Blue Mountain High Potential Route Segment would be partially screened by topography and vegetation but where the B2H Project would be visible along the Mill Creek Alternative, moderate impacts would occur as the existing 230-kV transmission line would be screened from view but the I-84 is located between the trail segment and the B2H Project. In addition to the presence of the proposed transmission line structures, the geometrically shaped cleared right-of-way would contrast with the existing vegetative forms in the Blue Mountains. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. Closer to the community of La Grande, views of the B2H Project (Link 2-10) from the Blue Mountain High Potential Route Segment would be dominated by the B2H Project as the trail segment is

paralleled for approximately 5 miles at the edge of the foreground distance zone. An existing 230-kV transmission line is located in proximity to the B2H Project but due to the B2H Project being located closer to the trail segment, as well as the relative scale of the proposed transmission line structures, high impacts would occur. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Views of the B2H Project from the Ladd Canyon High Potential Route Segment would be moderately affected as viewed in context with I-84 and an existing 230-kV transmission line in the middleground distance zone.

High Potential Historic Sites. Views from the Hilgard Junction High Potential Historic Site would be influenced by the B2H Project (Link 2-10) and contrast produced would attract attention in context with the existing 230-kV transmission line resulting in a moderate level of impacts. Due to topographic and vegetative screening on these views, the upper portion of the transmission line structures would be the primary element visible from this site.

Auto Tour Routes. The Mill Creek Alternative is located in proximity to the NPS auto tour route in three locations, (1) adjacent to Hilgard Junction, (2) in Ladd Canyon, and (3) south of Ladd Canyon. Views of the B2H Project from the NPS auto tour route north of Hilgard Junction would be highly affected within the foreground distance zone (0 to 0.5 mile), where the B2H Project (Link 2-10) is located closer than the existing 230-kV transmission line, with views intermittently screened by vegetation but where visible, the presence of the transmission line structures and geometric right-of-way vegetation clearing would dominate the setting. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. In Ladd Canyon, the B2H Project (Link 2-63) would cross the NPS auto tour route twice in two miles, resulting in high impacts. An existing 230-kV transmission line is located in proximity to the B2H Project but due to the scale of the proposed transmission line structures, compared to the existing structures, the B2H Project would dominate these views. To minimize these effects at the crossing of the NPS auto tour route, selective mitigation measures have been applied to maximize the span at the highway crossing to diminish the dominance of transmission line structures located adjacent to the route. South of Ladd Canyon, the NPS auto tour route would have views of the B2H Project traversing steep forested terrain within one mile of I-84 and then cross the NPS auto tour route further to the south with unobstructed views of the B2H Project (Link 2-70). An existing 230-kV transmission line is paralleled by the Mill Creek Alternative but due to the relative scale of the B2H Project, the introduction of transmission lines structures and geometric vegetation clearing would dominate views for this portion of the NPS auto tour route. The application of selective mitigation measures to minimize vegetation clearing and route construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-501.

Nature and Purpose. In the locations where the B2H Project would highly affect the Blue Mountain High Potential Route Segment and NPS auto tour route in steep forested terrain, the B2H Project would

compromise the trail's nature and purpose by dominating these views. As a result of these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Other Trail Management Areas. The Mill Creek Alternative does not cross any Oregon NHT trail segments. Also this route is not located in the USFS Oregon NHT Visual Corridor (i.e., 0.25-mile buffer from the Blue Mountains trail segment).

Scenic and Recreation Resources

Under the Mill Creek Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the Blue Mountains west of La Grande and the rolling foothills and grassland meadows north of the community of North Powder which have been modified by existing development including existing utilities, irrigated agricultural lands, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Additionally impacts on the Hilgard Junction trail-associated recreation site (Visual Resource KOP #4-19) are similar to those described for the corresponding high potential historic site. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-500.

Historic and Cultural Resources

Contributing Trail Segments. Under the Mill Creek Alternative, no contributing trail segments would be crossed by the B2H Project but the B2H Project would be located adjacent to contributing segments associated with the Blue Mountain and Ladd Canyon High Potential Route Segments as well as the NPS auto tour route. The contributing segments near the Blue Mountain High Potential Segment would be moderately affected due to views of the B2H Project being partially screened by topography and vegetation, but where visible, the B2H Project would introduce transmission line structures, construction access roads, and a geometrically shaped cleared right-of-way in context with I-84. The contributing trail segments closer to La Grande would be dominated by the B2H Project (Link 2-10) as the trail segment is paralleled for approximately 5 miles at the edge of the foreground distance zone. An existing 230-kV transmission line is located in proximity to the B2H Project but due to the B2H Project being located closer to the trail segment, as well as the relative scale of the proposed transmission line structures, high impacts would occur. The application of selective mitigation measures to minimize vegetation clearing and routing construction access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Views of the B2H Project from contributing trail segments near the Ladd Canyon High Potential Route Segment would be moderately affected as viewed in context with I-84 and an existing 230-kV transmission line in the middleground distance zone.

Views from the contributing trail segments near the NPS auto tour route, approximately 7 miles north of the community of North Powder, would be moderately affected by the B2H Project (Link 2-70) as the

setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and route construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level.

Trail-associated Cultural Sites. Impacts on views from Pioneer Spring would be low in magnitude as this trail-associated cultural site is located in an enclosed canyon where views of the B2H Project would be screened by topography. Impacts on views from the Hilgard Junction trail-associated cultural site would be the same as described for the high potential historic site with the same name. Views from the Oregon Trail Monument and Stone Marker south of Hilgard (NHT Inventory Observation Point #1-3) would be moderately affected by the B2H Project (Link 2-10) as transmission line structures and construction access roads would be constructed in the middleground distance zone beyond an existing 230-kV transmission line. Views from Emily Doone Grave 1868 would be highly affected by the B2H Project (Link 2-10) as the proposed transmission line structures would be located at the edge of the foreground distance zone, closer than the existing 230-kV transmission line and dominating the site's setting. Due to the proximity of the B2H Project there are limited opportunities to mitigate these effects without relocating the alternative alignment. Note, other alternatives and route variations use different alignments in this area. Due to the level of existing development in and adjacent to La Grande, the views from the Oregon Trail Monument, Stage Station, and Copper Kettle Grave cultural sites would be minimally affected by the B2H Project. North of Ladd Canyon, the Trading Post Site, Pioneer Grave Sites, Trading Post Site (Ladd Canyon), Pioneer Campsite, and Stage Station would have potential views of skylined transmission line structures, associated with the B2H Project (Link 2-63), in context with an existing 230-kV transmission line and I-84 resulting in moderate impacts on the setting associated with these sites. Impacts on views from the D. Dodge 1885 Inscription and adjacent Possible Pioneer Graves cultural sites would be moderate in magnitude as views of the B2H Project would occur from 1.5 miles away in context with I-84 and an existing 230-kV transmission line with the B2H Project's proposed transmission line structures backdropped by Tamarack Mountain reducing their level of dominance on the setting. Views from the Clover Creek Station trail-associated cultural site would be moderately affected by the B2H Project as the setting has already been modified by I-84 and agricultural land uses. The application of selective mitigation measures to use overland construction techniques where possible and routing construction access roads to minimize earthwork would lessen these impacts but remain at a moderate impact level. Due to the level of existing modifications in and adjacent to the community of North Powder, impacts on views resulting from the B2H Project on the Gentry Crossing site would be minimal.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including evergreen forests in the Blue Mountains and associated foothills south of Hilgard, grassland and shrubland dominated landscapes north of the community of North Powder, and narrow riparian vegetation corridors, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Conclusions

The Glass Hill Alternative would have the lowest overall impacts on the Oregon NHT as this alternative is located farthest from trail management and other NHT-associated resources associated with the Blue Mountains and Ladd Canyon high potential route segments. The Mill Creek Alternative parallels contributing trail segments, adjacent to the Blue Mountains high potential route segment, for 5 miles generating high impacts on the high potential route segment. The Applicant's Proposed Action Alternative, Mill Creek Alternative, and Variation S2-A1 would highly impact views from the NPS auto tour route near Hilgard whereas the Glass Hill Alternative and Variation S2-A2 would moderately impact these views. Variation S2-B1 would generate higher impacts on trail-associated cultural sites west of La Grande than Variation S2-B2 since the route located closer to these sites. Impacts on the Oregon NHT associated with Variations S2-C1 and S2-C2 are the same since both routes traverse similar landscape settings in proximity to each other. Variations S2-D1 and S2-D2 both have minimal impacts on the Oregon NHT due to the distance from trail resources. Variations S2-E1 and S2-E2 would have similar impacts on the Oregon NHT except Variation S2-E2 would have higher impacts on views from a contributing trail segment west of the Ladd Canyon high potential route segment. Impacts on the Oregon NHT associated with Variations S2-F1 and S2-F2 are similar but since Variation S2-F2 would be colocated with an existing 230-kV transmission line, which has modified the existing setting, the intensity of impacts on trail resources would be reduced along this variation. The Applicant's Proposed Action Alternative, Glass Hill, and Mill Creek alternatives would all require compensatory mitigation for high impacts on views from the NPS auto tour route with the Mill Creek Alternative also highly affecting the Blue Mountains high potential route segment. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 3—Baker Valley

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation.

- Table 3-503 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-504 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-505 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-506 presents the information on visibility of the B2H Project visible associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

- Table 3-507 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-508 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H Project alternatives and route variations in context with trail inventory data.

Table 3-503. Oregon National Historic Trail Summary of Residual Impacts for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	55.2	55.2	19.9	16.2	19.1
Variation S3-A1	*12.4*	*12.4*	*0.0*	*0.0*	*12.4*
Variation S3-A2	*12.2*	*12.2*	*0.0*	*0.0*	*12.2*
Variation S3-B1	*13.9*	*13.9*	*2.1*	*5.1*	*6.7*
Variation S3-B2	*14.4*	*12.9*	*1.7*	*6.7*	*4.5*
Variation S3-B3	*14.7*	*12.7*	*1.7*	*6.6*	*4.4*
Variation S3-B4	*14.3*	*12.3*	*1.2*	*6.4*	*4.7*
Variation S3-B5	*14.0*	*12.5*	*1.1*	*7.0*	*4.4*
Variation S3-C1	*21.1*	*21.1*	*15.5*	*5.6*	*0.0*
Variation S3-C2	*21.7*	*21.7*	*18.0*	*3.7*	*0.0*
Variation S3-C3	*21.1*	*21.1*	*11.7*	*4.3*	*5.1*
Variation S3-C4	*21.4*	*21.4*	*11.7*	*4.3*	*5.4*
Variation S3-C5	*21.0*	*21.0*	*5.0*	*2.4*	*13.6*
Variation S3-C6	*24.7*	*15.5*	*3.5*	*2.4*	*9.6*
Flagstaff A	55.3	53.8	18.9	18.1	16.8
Timber Canyon	70.3	16.7	9.2	1.7	5.8
Flagstaff A – Burnt River Mountain	55.3	53.8	15.1	16.8	21.9
Flagstaff B	56.0	54.0	19.5	17.7	16.8
Flagstaff B – Burnt River West	55.7	53.7	9.0	14.5	30.2
Flagstaff B – Durkee	59.6	48.4	7.5	14.5	26.4

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-504. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	67.0	57.0	5
Variation S3-A1	*23.1*	*19.0*	*0*
Variation S3-A2	*22.8*	*17.9*	*0*

Table 3-504. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Variation S3-B1	*19.9*	*17.8*	*1*
Variation S3-B2	*19.9*	*9.7*	*1*
Variation S3-B3	*19.9*	*9.7*	*1*
Variation S3-B4	*19.9*	*9.4*	*1*
Variation S3-B5	*19.9*	*9.4*	*1*
Variation S3-C1	*35.6*	*25.5*	*3*
Variation S3-C2	*35.6*	*25.5*	*3*
Variation S3-C3	*35.6*	*26.3*	*3*
Variation S3-C4	*35.6*	*26.3*	*3*
Variation S3-C5	*34.0*	*18.8*	*1*
Variation S3-C6	*27.6*	*12.5*	*1*
Flagstaff A	67.0	49.1	5
Timber Canyon	31.3	23.6	3
Flagstaff A – Burnt River Mountain	67.0	48.9	5
Flagstaff B	67.0	49.4	5
Flagstaff B – Burnt River West	65.1	40.5	3
Flagstaff B – Durkee	59.0	35.1	3

Table 3-505. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 3—Baker Valley

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]				
	Flagstaff Hill/NHOTIC		Oregon Trail ACEC – Flagstaff Hill	Oregon Trail ACEC – White Swan	Oregon Trail ACEC – Straw Ranch I	Oregon Trail ACEC – Straw Ranch II	Oregon Trail ACEC – Chimney Creek
Applicant's Proposed Action	Yes	None	Yes	No	Yes	No	No
Variation S3-A1	*No*	*None*	*No*	–	–	–	–
Variation S3-A2	*No*	*None*	*No*	–	–	–	–
Variation S3-B1	*Yes*	*None*	*Yes*	–	–	–	–
Variation S3-B2	*Yes*	*None*	*Yes*	–	–	–	–
Variation S3-B3	*Yes*	*None*	*Yes*	–	–	–	–
Variation S3-B4	*Yes*	–	*Yes*	–	–	–	–
Variation S3-B5	*Yes*	–	*Yes*	–	–	–	–

Table 3-505. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 3—Baker Valley

Alternative Route	High Potential Historic Sites[1]		Areas of Critical Environmental Concern[1]				
	Flagstaff Hill/NHOTIC	High Potential Route Segments[1]	Oregon Trail ACEC – Flagstaff Hill	Oregon Trail ACEC – White Swan	Oregon Trail ACEC – Straw Ranch I	Oregon Trail ACEC – Straw Ranch II	Oregon Trail ACEC – Chimney Creek
Variation S3-C1	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C2	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C3	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C4	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C5	–	–	–	–	*Yes*	*No*	*No*
Variation S3-C6	–	–	–	–	*Yes*	*No*	*No*
Flagstaff A	Yes	–	Yes	No	Yes	No	No
Timber Canyon	–	–	–	–	–	–	No
Flagstaff A – Burnt River Mountain	Yes	–	Yes	No	Yes	No	No
Flagstaff B	Yes	–	Yes	No	Yes	No	No
Flagstaff B – Burnt River West	Yes	–	Yes	No	Yes	No	No
Flagstaff B – Durkee	Yes	–	Yes	No	Yes	No	No

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-506. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	55.2	15.6	15.6	39.4	35.6
Variation S3-A1	*12.4*	*0.0*	*0.0*	*12.3*	*9.6*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*12.4*	*9.0*
Variation S3-B1	*13.9*	*1.4*	*1.4*	*12.5*	*11.5*
Variation S3-B2	*14.4*	*3.6*	*3.6*	*9.3*	*9.3*
Variation S3-B3	*14.7*	*3.5*	*3.5*	*9.2*	*9.2*
Variation S3-B4	*14.3*	*3.5*	*3.5*	*8.6*	*8.6*
Variation S3-B5	*14.0*	*3.5*	*3.5*	*8.7*	*8.7*
Variation S3-C1	*21.1*	*9.9*	*9.9*	*11.2*	*11.1*
Variation S3-C2	*21.7*	*14.7*	*14.7*	*7.0*	*6.9*

Table 3-506. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 3—Baker Valley

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Variation S3-C3	*21.1*	*6.9*	*6.9*	*14.1*	*14.1*
Variation S3-C4	*21.4*	*6.9*	*6.9*	*14.4*	*14.3*
Variation S3-C5	*21.0*	*2.2*	*2.2*	*18.7*	*13.1*
Variation S3-C6	*24.7*	*1.8*	*1.8*	*13.6*	*7.8*
Flagstaff A	55.3	17.7	17.7	35.7	32.9
Timber Canyon	70.3	7.9	7.9	8.6	3.4
Flagstaff A – Burnt River Mountain	55.3	14.7	14.7	38.6	35.9
Flagstaff B	56.0	17.7	17.7	36.2	33.4
Flagstaff B – Burnt River West	55.7	10.0	10.0	43.6	34.8
Flagstaff B – Durkee	59.6	9.6	9.6	38.6	30.1

Table 3-507. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 3—Baker Valley

Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Applicant's Proposed Action	11.4	11.4	53.0	35.7
Variation S3-A1	*0.0*	*0.0*	*19.4*	*13.9*
Variation S3-A2	*0.0*	*0.0*	*19.0*	*11.9*
Variation S3-B1	*0.9*	*0.9*	*22.4*	*12.0*
Variation S3-B2	*3.9*	*3.9*	*19.4*	*12.5*
Variation S3-B3	*4.3*	*4.2*	*19.1*	*12.8*
Variation S3-B4	*4.3*	*4.2*	*19.1*	*12.8*
Variation S3-B5	*3.9*	*3.9*	*19.4*	*12.5*
Variation S3-C1	*8.4*	*8.4*	*23.7*	*15.5*
Variation S3-C2	*14.4*	*14.3*	*17.7*	*9.5*
Variation S3-C3	*7.5*	*7.5*	*24.6*	*16.7*
Variation S3-C4	*7.5*	*7.5*	*24.6*	*16.7*
Variation S3-C5	*2.6*	*2.6*	*29.5*	*14.9*
Variation S3-C6	*2.5*	*2.4*	*26.8*	*9.9*
Flagstaff A	14.4	14.3	50.0	36.3
Timber Canyon	6.8	6.8	19.8	11.1
Flagstaff A – Burnt River Mountain	13.4	13.4	51.0	37.8

Table 3-507. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 3—Baker Valley				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Flagstaff B	14.7	14.6	49.7	36.5
Flagstaff B – Burnt River West	8.9	8.8	55.1	34.5
Flagstaff B – Durkee	8.8	8.6	52.8	31.3

Table 3-508. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 3—Baker Valley				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Applicant's Proposed Action	2.7	2.6	15.2	13.2
Variation S3-A1	*0.0*	*0.0*	*5.3*	*2.9*
Variation S3-A2	*0.0*	*0.0*	*5.3*	*2.9*
Variation S3-B1	*1.0*	*1.0*	*9.4*	*9.1*
Variation S3-B2	*0.8*	*0.8*	*9.6*	*2.1*
Variation S3-B3	*0.8*	*0.8*	*9.6*	*2.1*
Variation S3-B4	*0.7*	*0.7*	*9.8*	*1.9*
Variation S3-B5	*0.5*	*0.5*	*9.9*	*2.0*
Variation S3-C1	*0.7*	*0.6*	*4.5*	*3.2*
Variation S3-C2	*0.7*	*0.6*	*4.5*	*3.2*
Variation S3-C3	*0.0*	*0.0*	*5.2*	*3.9*
Variation S3-C4	*0.0*	*0.0*	*5.2*	*3.9*
Variation S3-C5	*0.0*	*0.0*	*5.2*	*3.7*
Variation S3-C6	*0.0*	*0.0*	*2.9*	*2.2*
Flagstaff A	2.3	2.1	15.7	6.3
Timber Canyon	0.7	0.6	4.4	3.4
Flagstaff A – Burnt River Mountain	1.6	1.6	16.3	6.7
Flagstaff B	2.6	2.4	15.4	6.4
Flagstaff B – Burnt River West	1.9	1.9	16.1	6.5
Flagstaff B – Durkee	1.9	1.9	13.8	4.8

Applicant's Proposed Action Alternative

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the east, would be highly affected by the B2H Project (Link 3-28) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting east of the historic site but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. Motorists on Oregon Highway 86, traveling eastbound, would have their viewshed increasingly dominated by the B2H Project approaching the NHOTIC including unobstructed views of skylined structures south of the highway on a ridge. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. The skylined structures on the ridge south of Oregon Highway 86 would require rerouting the alignment to avoid this entire ridgeline. Note, other alternatives and route variations follow different alignments in proximity to the NHOTIC with impacts occurring on other trail resources. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Applicant's Proposed Action Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) between Pleasant Valley and Durkee, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project (Link 3-54) would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-58) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line

structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507

Nature and Purpose. In three locations, (1) east of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Applicant's Proposed Action Alternative would not retain the historic character of the landscape east of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills south of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. In proximity to Flagstaff Hill, the B2H Project would dominate the trail setting as there are limited cultural modifications present and the introduction of the B2H Project would be incongruent with the setting in a highly sensitive trail area. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60) and affect adjacent recreation areas

including the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32) and Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33). Views toward the west from the NHOTIC, including Visual Resource KOPs #5-25a-e, would be minimally affected by the B2H Project, including views into Baker Valley, as viewers would be directed away from the B2H Project. Beginning at the Oregon Trail Kiwanis Club Memorial, recreation users would have their views increasingly dominated by the B2H Project approaching the entrance to the NHOTIC including views at the Oregon Trail Ruts Interpretive Site where unobstructed views of the B2H Project traversing a ridge to the south of Virtue Flat would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively.

The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, two contributing trail segment would be crossed by the B2H Project (1) east of the NHOTIC in Virtue Flat (Link 3-28) and (2) adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 3 locations (1) east of NHOTIC, (2) east of Pleasant Valley, and (3) in Swayze Creek. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting in Virtue Flat including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting in Virtue Flat but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. Contributing trail segments in the Oregon Trail ACEC – White Swan portion would also view the B2H Project in Virtue Flat but due to the distance (approximately 5 miles away) and elevated viewing angle, effects on these views after application of selective mitigation measures would be low in magnitude. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Applicant's Proposed Action Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep

terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) and possible site of the "Lone Tree" trail-associated cultural sites would be low in magnitude as the B2H Project (Link 3-4) would be located more than 2 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Views from the Oregon Trail Monument, located south of the NHOTIC, would be highly affected by the B2H Project through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-A1

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the B2H Project, would be screened by topography resulting in low impacts from the B2H Project on this route variation.

Auto Tour Routes. Views from the NPS auto tour route would be minimally affected by the B2H Project due to topographic screening and where visible, the B2H Project would be located adjacent to an existing 230-kV transmission line. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Areas of Critical Environmental Concern. This variation does not cross the Oregon Trail ACEC – Flagstaff Hill portion.

Scenic and Recreation Resources

Under Variation S3-A1, the addition of the B2H Project would modify the setting east of the trail where the trail traverses agricultural lands in Baker Valley. Due to topographic screening and I-84 paralleling the Oregon NHT in this area, the B2H Project would have minimal impacts on the trail setting. Impacts

on the NPS auto tour route are described above in the Trail Management section. Views from other recreation areas adjacent to the NHOTIC also would be screened by topography north of Flagstaff Hill resulting in low impacts. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Impacts on views from contributing trail segments in Baker Valley, Slough House Stage Station (Stop), and possible site of the "Lone Tree" trail-associated cultural sites would be low in magnitude as the B2H Project (Link 3-4) would be located more than 2 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley.

Biological, Natural, and Other Resources

The B2H Project would not modify characteristic vegetation communities associated with the Oregon NHT, where the trail is traversing through agricultural lands in Baker Valley adjacent to I-84, as the B2H Project would be located further to the east with views of right-of-way vegetation clearing screened from view and adjacent to an existing 230-kV transmission line.

Variation S3-A2

Impacts on the Oregon NHT are similar to Variation S3-A1, since both routes are colocated, with a slight increase in effects on views associated with Variation S3-A1 from being located approximately 0.25 mile closer to trail-associated resources in Baker Valley.

Variation S3-B1

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the east, would be highly affected by the B2H Project (Link 3-28) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting east of the historic site but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. Motorists on Oregon Highway 86, traveling eastbound, would have their viewshed increasingly dominated by the B2H Project approaching the NHOTIC including unobstructed views of skylined structures south of the highway on a ridge. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. The skylined structures on the ridge south of Oregon Highway 86 would require rerouting the alignment to avoid this entire ridgeline. Note, other alternatives and route variations follow different alignments in proximity to the NHOTIC with impacts occurring on other trail resources. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. Variation S3-B1 approaches the NPS auto tour route southeast of Baker City where the Oregon NHT is located in a natural setting, 3 miles north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. East of the NHOTIC, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component including the Oregon Trail ACEC – Flagstaff Hill portion. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-B1 does not cross the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under Variation S3-B1 would not retain the historic character of the landscape east of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under Variation S3-B1, the addition of the B2H Project would modify the trail setting in typical landscape settings such Virtue Flat and the arid rolling hills east of Flagstaff Hill which are generally intact except for the Virtue Flat ATV area and shooting range. The B2H Project would dominate the trail setting, as there are limited cultural modifications present, and the introduction of the B2H Project would be incongruent with the setting in a highly sensitive trail area. The application of selective mitigation measures including minimizing vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e, and 5-60) and affect adjacent recreation areas including the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32) and Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33). Views toward the west from the NHOTIC, including Visual Resource KOPs #5-25a-e, would be minimally affected by the B2H Project, including views into Baker Valley, as viewers would be directed away from the B2H Project. Beginning at the Oregon Trail Kiwanis Club Memorial, recreation users would have their views increasingly dominated by the B2H Project approaching the entrance to the NHOTIC including views at the Oregon Trail Ruts Interpretive

Site where unobstructed views of the B2H Project traversing a ridge to the south of Virtue Flat would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively.

The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, one contributing trail segment would be crossed by the B2H Project (Link 3-28) east of the NHOTIC in Virtue Flat. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with this contributing segments east of NHOTIC. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting in Virtue Flat including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The Virtue Flat ATV area and shooting range have modified the setting in Virtue Flat but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Contributing trail segments in the Oregon Trail ACEC – White Swan portion would also view the B2H Project in Virtue Flat but due to the distance (approximately 5 miles away) and elevated viewing angle, effects on these views after application of selective mitigation measures would be low in magnitude. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) and possible site of the "Lone Tree" trail-associated cultural sites would be low in magnitude as the B2H Project would be located more than 2 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Views from the Oregon Trail Monument, located south of the NHOTIC, would be highly affected by the B2H Project through the introduction of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in Virtue Flat and south of Flagstaff Hill, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-B2

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-37) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. Variation S3-B2 (Link 3-48) parallels the NPS auto tour route southeast of Baker City for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. West of the NHOTIC, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component including the Oregon Trail ACEC – Flagstaff Hill portion. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-B2 does not cross the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the

Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under Variation S3-B2 would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under Variation S3-B2, the addition of the B2H Project would modify the trail setting in the arid rolling hills southwest of Flagstaff Hill as the Oregon NHT travels out of the agricultural modified Baker Valley into natural, arid lands. The existing 230-kV transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project (Link 3-37) would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility as the existing 230-kV transmission line is located further away at the edge of Baker Valley and is smaller in scale when compared to the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-B2, one contributing trail segment would be crossed by the B2H Project (Link 3-37) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with this contributing segment west of NHOTIC. As previously described for impacts on

views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes along Flagstaff Hill, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-B3

Impacts on the Oregon NHT are similar to Variation S3-B2 since Variation S3-B3 shares the same alignment in proximity to trail resources near Flagstaff Hill and Baker Valley.

Variation S3-B4

Trail Management

High Potential Historic Route Segments. No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-32) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line, located closer to Flagstaff Hill than the B2H Project, has modified this setting but

due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project adjacent to the existing 230-kV transmission line to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. Variation S3-B4 (Link 3-48) parallels the NPS auto tour route southeast of Baker City for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. West of the NHOTIC, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component including the Oregon Trail ACEC – Flagstaff Hill portion. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-B4 does not cross the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under Variation S3-B4 would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under Variation S3-B4, the addition of the B2H Project would modify the trail setting in the arid rolling hills southwest of Flagstaff Hill as the Oregon NHT travels out of the agricultural modified Baker Valley into natural, arid lands. The existing 230-kV transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads,

use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project (Link 3-37) would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 2,000 feet away and the existing 230-kV transmission line from approximately 1,500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility especially where due to the shorter height of the existing 230-kV transmission line would be intermittently screened from view. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-B4, one contributing trail segment would be crossed by the B2H Project (Link 3-37) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with this contributing segments west of NHOTIC. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the "Lone Tree" trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes along Flagstaff Hill, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-B5

Impacts on the Oregon NHT are similar to Variation S3-B4 since Variation S3-B5 shares the same alignment in proximity to trail resources except for a 2.5 mile long segment west of Flagstaff Hill (Link 3-34) where Variation S2-B5 is located 200 feet further to the west.

Variation S3-C1

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. Variation S3-C1 is located in proximity to the NPS auto tour route between Pleasant Valley and Durkee and near Weatherby. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-58) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an

additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In two locations near the NPS auto tour route, (1) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (2) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC –Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from contributing trail segments, trail-associated resources located in the Oregon Trail ACEC-Straw Ranch I, are described in the Historic and Cultural Resources section.

Scenic and Recreation Resources

Under Variation S3-C1, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills south of Pleasant Creek, Durkee Valley, and in Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section including those associated with the Weatherby Rest Area. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-C1, one contributing trail segments would be crossed by the B2H Project (Link 3-80) adjacent to Swayze Creek. To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting

associated with contributing segments east of Pleasant Valley and in Swayze Creek. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as Variation S3-C1 does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes south of south of Pleasant Creek and in Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-C2

Impacts on the Oregon NHT are similar to Variation S3-C1 except for increased impacts on the NPS auto tour route. Variation S3-C2 (Link 3-42) parallels I-84 for approximately 7 miles, adjacent to an existing 138-kV transmission line, before turning to the east away from the NPS auto tour route north of Durkee. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would highly impact views from the NPS auto tour route. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect these views. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Variation S3-C3

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. Variation S3-C3 is located in proximity to the NPS auto tour route near Pleasant Valley and Weatherby. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project in proximity to the Oregon NHT congressional alignment as the B2H Project (Link 3-72) parallels the NPS auto tour route and then crosses I-84 less than 0.5 mile north of the rest area. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby (Link 3-88), within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In two locations near the NPS auto tour route, (1) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion and (2) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-C3 does not cross the Oregon Trail ACEC – Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from contributing trail segments, trail-associated resources located in the Oregon Trail ACEC – Straw Ranch I, are described in the Historic and Cultural Resources section.

Scenic and Recreation Resources

Under Variation S3-C3, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills east of Pleasant Creek, Durkee Valley, and in Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have

been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section including those associated with the Weatherby Rest Area. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-C3, no contributing trail segments would be crossed by the B2H Project but the B2H Project would highly affect the setting associated with contributing segments east of Pleasant Valley. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes east of Pleasant Creek and in Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-C4

Impacts on the Oregon NHT are similar to Variation S3-C3 since Variation S3-C4 shares the same alignment in proximity to trail resources adjacent to the Oregon Trail ACEC – Straw Ranch I and Chimney Creek portions and the NPS auto tour route.

Variation S3-C5

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. Variation S3-C5 is located in proximity to the NPS auto tour route near Pleasant Valley and Dixie. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Dixie would be highly affected by the B2H Project (Link 3-73) in proximity to the Oregon NHT congressional alignment as the B2H Project approaches the NPS auto tour route at the end of Segment 3. The B2H Project would dominate views in the foreground distance zone traversing steep mountainous terrain. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the proposed transmission line structures, the B2H Project would dominate views in this area. Note, views of the B2H Project from the Weatherby Rest Area (Visual Resource KOP #5-31) would be screened by topography. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In two locations near the NPS auto tour route, (1) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion and (2) near Dixie along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from this trail management component. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. Variation S3-C5 does not cross the Oregon Trail ACEC – Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from contributing trail segments, trail-associated resources located in the Oregon Trail ACEC- Straw Ranch I, are described in the Historic and Cultural Resources section.

Scenic and Recreation Resources

Under Variation S3-C5, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills east of Pleasant Creek, Durkee Valley, and in Burnt River Canyon characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the

B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S3-C5, no contributing trail segments would be crossed by the B2H Project but the B2H Project would highly affect the setting associated with contributing segments east of Pleasant Valley. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes east of Pleasant Creek and in Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S3-C6

Impacts on the Oregon NHT are similar to Variation S3-C5 since Variation S3-C6 shares the same alignment in proximity to trail resources adjacent to the Oregon Trail ACEC – Straw Ranch I and Chimney Creek portions and the NPS auto tour route.

Flagstaff A Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-34) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line, located closer to Flagstaff Hill than the B2H Project, has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project adjacent to the existing 230-kV transmission line to access the NHOTIC and adjacent recreation

areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff A Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) between Pleasant Valley and Durkee, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-54) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would highly dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-80) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required

to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Applicant's Proposed Action Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff A Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff A Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line. The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project (Link 3-34) would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 2,000 feet away and the existing 230-kV transmission line from approximately 1,500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility especially where due to the shorter height of the existing 230-kV transmission line it would be intermittently screened from view. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60)

would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff A Alternative, two contributing trail segment would be crossed by the B2H Project (1) west of the NHOTIC at the edge of Baker Valley (Link 3-34) and (2) adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 3 locations (1) west of NHOTIC, (2) east of Pleasant Valley, and (3) in Swayze Creek. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Flagstaff A Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be

mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Timber Canyon Alternative

Trail Management

No high potential historic route segments or high potential historic sites are located in the trail-specific study corridor.

Auto Tour Routes. The Timber Canyon Alternative is located in proximity to the NPS auto tour route near Weatherby. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. Near Weatherby, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Timber Canyon Alternative does not cross the Oregon Trail ACEC – Chimney Creek portion. Note, no other trail-associated resources were identified in this portion of the Oregon Trail ACEC.

Scenic and Recreation Resources

Under the Timber Canyon Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by a narrow riparian corridor with

adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section including those associated with the Weatherby Rest Area. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Timber Canyon Alternative, one contributing trail segment would be crossed by the B2H Project adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures would be applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in Swayze Creek. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Timber Canyon Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. No additional known trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT in Burnt River Canyon through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff A – Burnt River Mountain Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-34) through the introduction of

transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line, located closer to Flagstaff Hill than the B2H Project, has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project adjacent to the existing 230-kV transmission line to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff A – Burnt River Mountain Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) near Pleasant Valley, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment as the B2H Project parallels the NPS auto tour route and then crosses I-84 less than 0.5 mile north of the rest area. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Flagstaff A – Burnt River Mountain Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff A – Burnt River Mountain Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff A – Burnt River Mountain Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls. These areas have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line. The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 2,000 feet away and the existing 230-kV transmission line from approximately 1,500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility especially where due to the shorter height of the existing 230-kV transmission line, it would be intermittently screened from view. The application of

selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff A – Burnt River Mountain Alternative, one contributing trail segment would be crossed by the B2H Project (Link 3-34) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 2 locations (1) west of NHOTIC and (2) east of Pleasant Valley. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of

backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff B Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-37) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff B Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) between Pleasant Valley and Durkee, and (3) near Weatherby and adjacent rest area. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-58) begins to parallel the NPS auto route for approximately 5 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of

skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly impact views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Weatherby, including the Weatherby Rest Area (Visual Resource KOP #5-31) would be highly affected by the B2H Project (Link 3-88) in proximity to the Oregon NHT congressional alignment. The B2H Project would continue to parallel the NPS auto tour route for an additional 4 miles south of Weatherby, within the foreground distance zone, resulting in high impacts and dominating views between Weatherby and Dixie. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the B2H Project and the introduction of transmission line structures on ridges, resulting in views of skylined structures, and construction of access roads in steep terrain, the B2H Project would dominate views in this area. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) between Pleasant Valley and Durkee along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Weatherby along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Flagstaff B Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff B Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff B Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line.

The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to the Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility as the existing 230-kV transmission line is located further away at the edge of Baker Valley and is smaller in scale when compared to the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff B Alternative, two contributing trail segments would be crossed by the B2H Project (1) west of the NHOTIC at the edge of Baker Valley (Link 3-37) and (2) adjacent to Swayze Creek (Link 3-80). To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 3 locations (1) west of NHOTIC, (2) east of Pleasant Valley, and (3) in Swayze Creek. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on

ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. In Swayze Creek and into Pearce Gulch, the setting associated with contributing trail segments would be dominated by the B2H Project as the Flagstaff B Alternative does not parallel the existing 138-kV transmission line in this area. The introduction of the B2H Project would be incongruent with the existing setting including the presence of skylined transmission line structures and the construction of access roads on steep terrain adjacent to the trail. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff B – Burnt River West Alternative

Trail Management

No high potential historic route segments are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Flagstaff Hill/NHOTIC High Potential Historic Site, toward the west, would be highly affected by the B2H Project (Link 3-37) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV line has modified this setting but due to its shorter height and wooden design components, compared to the proposed project design, the B2H Project would dominate the setting adjacent to the Flagstaff Hill and unobstructed views into Baker Valley. Additionally, motorists on Oregon Highway 86, traveling eastbound, would pass under the B2H Project to access the NHOTIC and adjacent recreation areas. The application of selective mitigation measures to span Oregon

Highway 86, minimize earthwork associated with the construction of access roads, and modifying project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Additional description of recreation-based impacts on the NHOTIC and surrounding area is included in the subsequent Scenic and Recreation Resources section.

Auto Tour Routes. The Flagstaff B – Burnt River West Alternative is located in proximity to the NPS auto tour route in three locations (1) southeast of Baker City where the Oregon NHT is located approximately 3 miles away, (2) near Pleasant Valley, and (3) near Dixie. Southeast of Baker City, the B2H Project would parallel I-84 for approximately 2 miles where the Oregon NHT is located in a natural setting, north of I-84, beyond view of the NPS auto tour route. Due to this separation between the auto tour route and NHT, as well as the existing 138-kV transmission line which has modified the existing setting, moderate impacts on the NPS auto tour route were identified in this area. To minimize impacts from the construction of access roads in this area, selective mitigation was applied to use overland construction techniques to the extent practicable. South of Pleasant Valley, near Visual Resource KOP #5-26, the B2H Project (Link 3-60) crosses I-84 and then continues to the south out of view of the NPS auto tour route. Due to the unobstructed views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing, high impacts on views from this portion of the NPS auto tour route would occur. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, as well as maximizing the span at the I-84 crossing would lessen these impacts but remain at a high impact level. Views from the NPS auto tour adjacent to Dixie would be highly affected by the B2H Project (Link 3-73) in proximity to the Oregon NHT congressional alignment as the B2H Project approaches the NPS auto tour route at the end of Segment 3. The B2H Project would dominate views in the foreground distance zone traversing steep mountainous terrain. An existing 138-kV transmission line is located adjacent to the B2H Project but due to the relative scale of the proposed transmission line structures, the B2H Project would dominate views in this area. Note, views of the B2H Project from the Weatherby Rest Area (Visual Resource KOP #5-31) would be screened by topography. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-507.

Nature and Purpose. In three locations, (1) west of NHOTIC including the Oregon Trail ACEC – Flagstaff Hill portion, (2) near Pleasant Valley along the NPS auto tour route and Oregon Trail ACEC – Straw Ranch I portion, and (3) near Dixie along the NPS auto tour route, the B2H Project would compromise the trail's nature and purpose by dominating views from trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Flagstaff B – Burnt River West Alternative does not cross the Oregon Trail ACEC – Flagstaff Hill, White Swan, Straw Ranch I, Straw Ranch II, and Chimney Creek portions. Impacts on views from the Flagstaff Hill/NHOTIC High Potential Historic Site

and contributing trail segments and Oregon Trail Monument, trail-associated resources located in the Flagstaff portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Impacts on views from contributing trail segments, trail-associated resources located in the other portions of the ACEC, are described in the Historic and Cultural Resources section.

Other Trail Management Areas. Due to the high impacts on the NHOTIC, the introduction of the B2H Project under the Flagstaff B – Burnt River West Alternative would not retain the historic character of the landscape west of the NHOTIC as suggested in the Baker County NHOTIC zoning overlay.

Scenic and Recreation Resources

Under the Flagstaff B – Burnt River West Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings such as the arid rolling hills southwest of Flagstaff Hill, Durkee Valley, and Burnt River Canyon, characterized by a narrow riparian corridor with adjacent arid canyon walls, which have been influenced by existing agricultural development, a 138-kV transmission line, and I-84. Southwest of Flagstaff Hill, as the Oregon NHT travels out of the agricultural modified Baker Valley in natural arid lands, the B2H Project would modify the trail setting adjacent to an existing 230-kV transmission line. The existing transmission line and agricultural development have modified the setting from its historic use but due to the relative scale of the B2H Project, the setting immediately adjacent to Flagstaff Hill would be dominated by the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level.

Impacts on the NPS auto tour route are described above in the Trail Management section. As discussed under Trail Management, the B2H Project would highly affect views on the NHOTIC (Visual Resource KOPs #5-25a, 5-25b, 5-25c, 5-25d, 5-25e) especially from Panorama Point Visual Resource KOP #5-25c) which would have unobstructed views of the B2H Project from approximately 500 feet away. Impacts on views from other NHOTIC KOPs also would be high in magnitude including those from the picture windows in the NHOTIC and hiking trails west of the facility as the existing 230-kV transmission line is located further away at the edge of Baker Valley and is smaller in scale when compared to the B2H Project. The application of selective mitigation measures to minimize earthwork associated with the construction of access roads, use overland construction techniques where possible, and modify the project design to better match the existing 230-kV transmission line structures would lessen these impacts but remain at a high level. Views from the Oregon Trail Kiwanis Club Memorial (Visual Resource KOP #5-32), Oregon Trail Ruts Interpretive Site (Visual Resource KOP #5-33), and NHOTIC entrance (KOP #5-60) would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. For recreation and socioeconomic-specific effects on the NHOTIC, refer to Sections 3.2.8 and 3.2.17 respectively. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-506.

Historic and Cultural Resources

Contributing Trail Segments. Under the Flagstaff B – Burnt River West Alternative, one contributing trail segment would be crossed by the B2H Project (Link 3-37) west of the NHOTIC at the edge of Baker Valley. To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across the trail segment. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 2 locations (1) west of NHOTIC and (2) east of Pleasant Valley. As previously described for impacts on views from the NHOTIC, the B2H Project would dominate the setting west of Flagstaff Hill including the setting adjacent to this contributing trail segment (Oregon Trail ACEC – Flagstaff Hill) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing. The existing 230-kV transmission line and agricultural development in Baker Valley have modified the setting west of Flagstaff Hill but due to the relative scale of the B2H Project compared to these existing modifications, the B2H Project would dominate the setting. East of Pleasant Valley, contributing trail segments in the Oregon Trail ACEC – Straw Ranch I also would be highly affected by the B2H Project (Link 3-54) as transmission line structures would be skylined on ridges on either side of the trail. An existing 138-kV transmission line is located in proximity to the B2H Project but due to the relative scale of the B2H Project and the construction of access roads on steep terrain, the trail setting would be dominated by the B2H Project in this area with limited other cultural modifications. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-508.

Trail-associated Cultural Sites. Impacts on views from Slough House Stage Station (Stop) would be low in magnitude as the B2H Project would be located more than 3 miles away adjacent to an existing 230-kV transmission line in level to slightly rolling terrain in Baker Valley. Moderate impacts on views from the possible site of the “Lone Tree” trail-associated cultural sites would occur where the B2H Project (Link 3-24) would be located 1.5 miles away closer to the site than the existing 230-kV transmission line. Views from the Oregon Trail Monument, located south of the NHOTIC, would be mostly screened by topography but where the B2H Project would be visible, the introduction of backdropped transmission line structures would influence these views but not dominate the viewshed. Impacts on views from the Flagstaff Hill trail-associated cultural site would be the same as those described for the high potential historic site with the same name.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes southwest of Flagstaff Hill and in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Flagstaff B – Durkee

Impacts on the Oregon NHT are similar to Flagstaff B – Burnt River West Alternative since Flagstaff B – Durkee Alternative shares the same alignment in proximity to trail resources in Baker Valley and adjacent to the NPS auto tour route, as well as in proximity to the Oregon Trail ACEC – Straw Ranch I and Chimney Creek portions.

Conclusions

The Timber Canyon Alternative would have the lowest overall impacts on the Oregon NHT as this alternative avoids the NHOTIC and other trail resources between Baker City and Durkee including the Oregon Trail ACEC – Flagstaff Hill and Straw Ranch I portions. All other alternatives would highly impact the NHOTIC and environs including the high potential historic site, contributing trail segments, recreation opportunities, and the Oregon Trail ACEC – Flagstaff Hill portion. Impacts on the NHOTIC associated with the Applicant's Proposed Action Alternative would occur in Virtue Flat, an area with limited visible modifications. The Flagstaff A and Flagstaff A – Burnt River Mountain alternatives would be viewed in context with the smaller existing 230-kV transmission line whereas the Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee alternatives would be viewed directly adjacent to a viewpoint associated with the NHOTIC. East of Pleasant Valley, all alternatives except the Timber Canyon Alternative would highly impacts views from contributing trail segments in the Oregon Trail ACEC – Straw Ranch I portion. Further to the south, the Applicant's Proposed, Timber Canyon, Flagstaff A, and Flagstaff B alternatives also would highly impact views from contributing trail segments southeast of the community of Durkee. The other alternative routes would be located west of I-84 and avoid approaching these trail segments. All alternatives would require compensatory mitigation for high impacts on views from the NPS auto tour route, in addition all alternatives except the Timber Canyon Alternative, would highly impact the Flagstaff Hill/NHOTIC high potential historic site and the Oregon Trail ACEC – Flagstaff Hill and Straw Ranch I portions. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 4—Brogan

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Six tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-509 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-510 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-511 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation.

These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.

- Table 3-512 presents the information on visibility of the B2H Project associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- Table 3-513 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.
- Similarly, Table 3-514 identifies the extent of contributing trail segments in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-509. Oregon National Historic Trail Summary of Residual Impacts for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.1	10.5	4.3	3.6	2.6
Variation S4-A1	*5.9*	*5.9*	*3.5*	*2.4*	*0.0*
Variation S4-A2	*6.0*	*6.0*	*4.1*	*1.9*	*0.0*
Variation S4-A3	*6.1*	*6.1*	*4.2*	*1.9*	*0.0*
Tub Mountain South	40.5	35.0	15.1	9.8	10.1
Willow Creek	34.6	17.5	4.3	7.2	6.0

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-510. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 4—Brogan

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	19.0	13.0	0
Variation S4-A1	*19.0*	*12.9*	*0*
Variation S4-A2	*19.0*	*13.0*	*0*
Variation S4-A3	*19.0*	*13.0*	*0*
Tub Mountain South	45.6	35.4	2
Willow Creek	28.6	16.5	0

Table 3-511. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 4—Brogan

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]	
	Farewell Bend	Alkali Springs	Oregon Trail ACEC – Tub Mountain	Oregon Trail ACEC – Birch Creek
Applicant's Proposed Action	–	–	–	–
Variation S4-A1	–	–	–	–
Variation S4-A2	–	–	–	–
Variation S4-A3	–	–	–	–
Tub Mountain South	No	Yes	No	Yes
Willow Creek	No	No	No	No

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-512. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	40.1	1.7	1.7	8.8	7.6
Variation S4-A1	*5.9*	*1.5*	*1.5*	*4.5*	*4.4*
Variation S4-A2	*6.0*	*2.5*	*2.5*	*3.4*	*3.4*
Variation S4-A3	*6.1*	*1.8*	*1.8*	*4.1*	*4.1*
Tub Mountain South	40.5	12.3	12.3	22.5	20.2
Willow Creek	34.6	1.7	1.7	15.7	12.8

Table 3-513. Oregon National Historic Trail Project Visibility from Auto Tour Route for Segment 4—Brogan

Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Views of the B2H Project	Miles of Auto Tour Route	Miles with Views of the B2H Project
Applicant's Proposed Action	2.4	2.4	14.5	10.2
Variation S4-A1	*2.4*	*2.4*	*14.4*	*7.5*
Variation S4-A2	*3.4*	*3.4*	*13.4*	*6.5*
Variation S4-A3	*2.2*	*2.2*	*14.6*	*7.4*
Tub Mountain South	11.3	10.8	14.5	8.0
Willow Creek	2.4	2.4	18.8	11.7

Table 3-514. Oregon National Historic Trail Project Visibility from Contributing Trail Segments for Segment 4—Brogan				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Contributing Trail Segments	Miles with views of the B2H Project	Miles of Contributing Trail Segments	Miles with Views of the B2H Project
Applicant's Proposed Action	0.2	0.1	2.2	2.0
Variation S4-A1	*0.2*	*0.1*	*2.2*	*2.0*
Variation S4-A2	*0.3*	*0.2*	*2.1*	*1.8*
Variation S4-A3	*0.3*	*0.2*	*2.1*	*1.8*
Tub Mountain South	8.7	8.7	18.3	12.6
Willow Creek	0.2	0.1	15.1	6.1

Applicant's Proposed Action Alternative

Trail Management

No high potential historic sites or high potential historic route segments are located in the trail-specific study corridor.

Auto Tour Routes. The Applicant's Proposed Action Alternative is located in proximity to the NPS auto tour route between the communities of Dixie and Huntington. South of Dixie the B2H Project (Link 4-13) would parallel the NPS auto route for approximately 6 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious recreation experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. Between the communities of Dixie and Huntington, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands, which have been influenced by an existing 138-kV transmission line and I-84. The application of

selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under the Applicant's Proposed Action Alternative, no contributing trail segment would be crossed by the B2H Project. The B2H Project (Link 4-13) would moderately affect the setting associated with contributing segments north of Huntington where a 138-kV transmission line and I-84 have modified the existing setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-514.

Trail-associated Cultural Sites. Views from the Pioneer Graves (south of Huntington) trail-associated cultural site would be minimally affected as the B2H Project would be screened by topography and located more than 3 miles away with an existing 138-kV transmission line and I-84 located closer to the cultural site than the B2H Project.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S4-A1

Trail Management

No high potential historic sites or high potential historic route segments are located in the trail-specific study corridor.

Auto Tour Routes. Variation S4-A1 is located in proximity to the NPS auto tour route between the communities of Dixie and Huntington. South of Dixie the B2H Project (Link 4-13) would parallel the NPS auto route for approximately 6 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each

structure would highly affect views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. Between the communities of Dixie and Huntington, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under Variation S4-A1, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands, which have been influenced by an existing 138-kV transmission line and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. No other trail-associated recreation areas are located in the trail-specific study corridor. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under Variation S4-A1, no contributing trail segment would be crossed by the B2H Project. The B2H Project (Link 4-13) would moderately affect the setting associated with contributing segments north of Huntington where a 138-kV transmission line and I-84 have modified the existing setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-514.

Trail-associated Cultural Sites. No trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Variation S4-A2

Impacts on the Oregon NHT would be similar to Variation S4-A1 except Variation S4-A2 is located closer to the NPS auto tour route and contributing trail segments north of Huntington resulting in more intense impacts as the B2H Project (Link 4-17) would introduce transmission line structures, construction access roads, and right-of-way vegetation clearing closer to these trail resources than the existing 138-kV transmission line.

Variation S4-A3

Impacts on the Oregon NHT would be similar to Variation S4-A1 except Variation S4-A3 is located closer to the NPS auto tour route and contributing trail segments north of Huntington resulting in more intense impacts as the B2H Project (Link 4-17) would introduce transmission line structures, construction access roads, and right-of-way vegetation clearing closer to these trail resources than the existing 138-kV transmission line.

Tub Mountain South Alternative

Trail Management

High Potential Historic Sites. Views from the Farewell Bend High Potential Historic Site would be moderately affected by the B2H Project (Link 4-75) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing in proximity to an existing 138-kV transmission line and I-84. Views of the B2H Project from Farewell Bend would be partially screened by riparian vegetation adjacent to the Snake River but where visible, the proposed transmission line structures would be mostly backdropped by arid rolling hills. The application of selective mitigation measures to route construction access roads to minimize earthwork and use overland construction techniques where possible would lessen these impacts but remain at a moderate impact level.

High Potential Historic Route Segments. Views of the B2H Project (Link 4-75) from the Alkali Springs High Potential Historic Route Segment would be intermittently screened by Tub Mountain, and adjacent rolling hills, between McCarthy Springs and Tub Springs resulting in low impacts where the B2H Project would be screened from view. Where visible, the upper portions of the transmission lines structures would be the primary element in view and located more than 2 miles away, resulting in short duration views of the B2H Project minimally affecting the Alkali Springs High Potential Historic Route Segment in this area. In locations where the B2H Project would be visible, including the areas near Tub Springs and Alkali Springs, moderate impacts on the setting would occur as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats. As the Alkali Springs High Potential Historic Route Segment approaches Willow Creek, the B2H Project would cross the segment and dominate the viewshed where unobstructed views of partially skylined structures would occur. The application of selective mitigation measures to span the trail segment, use overland construction techniques (except across the trail segment), and route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level.

Auto Tour Routes. The Tub Mountain South Alternative is located in proximity to the NPS auto tour route between the community of Dixie and Farewell Bend within the foreground distance zone for approximately 10 miles. An existing 138-kV transmission is located adjacent to the B2H Project except for a portion between Huntington and Farewell Bend. Due to the unobstructed views of the B2H Project (Link 4-30), including transmission line structures, construction access roads, and right-of-way vegetation clearing, and the relative scale of the existing transmission line, the B2H Project would dominate views from the NPS auto tour route resulting in long duration high impacts. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. In three locations, (1) southern portion of the Alkali Springs High Potential Historic Route Segment, (2) the interpretive site located in the Oregon Trail ACEC - Birch Creek portion, and (3) along the NPS auto tour route between Dixie and Farewell Bend, the B2H Project would compromise the trail's nature and purpose by dominating views from these trail management components. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Areas of Critical Environmental Concern. The Tub Mountain South Alternative does not cross the Oregon Trail ACEC – Birch Creek and Tub Mountain portions. Impacts on views from the Birch Creek Interpretive Site and contributing trail segments, trail-associated resources located in the Birch Creek portion of the ACEC, are described in the Scenic and Recreation Resources and Historic and Cultural Resources sections respectively. Impacts on views from the Alkali Springs High Potential Historic Route Segment and contributing trail segments as well as adjacent springs, trail-associated resources located in the Tub Mountain portion of the ACEC, are described in the Trail Management and Historic and Cultural Resource sections respectively. Additionally impacts on views from the Alkali Springs and Tub Mountain interpretive sites, both located in the Tub Mountain portion of the ACEC, are described in the Scenic and Recreation Resources section.

Scenic and Recreation Resources

Under the Tub Mountain South Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls and arid rolling hills west of Huntington and Farewell Bend, which have been influenced by an existing 138-kV transmission line and I-84. Further to the south, the B2H Project would modify the setting in the Alkali Flats into the valley adjacent to Willow Creek. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Moderate impacts on views from Farewell Bend State Recreation Area (Visual Resource KOP #5-13) would occur as described in the Trail Management section regarding views from Farewell Bend High Potential Historic Site. The B2H Project (Link 4-75) would highly affect views from the Birch Creek Interpretive

Site (Visual Resource KOP #8-3) within the Oregon Trail ACEC – Birch Creek portion. Unobstructed views of the B2H Project within the foreground distance zone, including skylined transmission line structures, would dominate the setting from this interpretive site and across Birch Creek. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level as there are limited opportunities to screen the proposed transmission line structures. Views from the Alkali Springs Interpretive Site (Visual Resource KOP #8-1), located in the Oregon Trail ACEC – Tub Mountain, would be moderately affected by the B2H Project as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats. Moderate impacts on views from the Tub Mountain Interpretive Site (Visual Resource KOP #8-103) located in the Oregon Trail ACEC – Tub Mountain, would result from the introduction of the B2H Project to the southeast of this site. Views of the B2H Project would be screened from view by Tub Mountain, and a hill east of the site, until Alkali Gulch where views of backdropped transmission line structures would occur approximately 2 miles away in Alkali Flats. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under the Tub Mountain South Alternative, 5 contributing trail segment would be crossed by the B2H Project (Link 4-75). To mitigate these direct effects on the trail segment, selective mitigation measures were applied to span the trail and to prohibit construction activities such as access road construction, right-of-way vegetation clearing, and other practices across these trail segments. Additionally, the B2H Project would highly affect the setting associated with contributing segments in 2 locations (1) west of Farewell Bend, and (2) east of Willow Creek. West of Farewell Bend, the B2H Project would cross 4 contributing trail segments and highly affect the viewshed from these trail segments including trail segments located in the Oregon Trail ACEC – Birch Creek portion. Unobstructed views of the B2H Project within the foreground distance zone, including skylined transmission line structures, would dominate the setting from these trail segments including segments along Birch Creek. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level as there are limited opportunities to screen the proposed transmission line structures. Further to the south, the B2H Project would cross and highly affect the setting associated with a contributing trail segment east of Willow Creek. The viewshed would be dominated by unobstructed views of partially skylined transmission line structures at the edge of agricultural lands along Willow Creek and natural lands to the east. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. Impacts on contributing trail segments in the Oregon Trail ACEC – Tub Mountain portion would vary based on visibility of the B2H Project due to topography screening from Tub Mountain and adjacent rolling hills. Between McCarthy Springs and Tub Springs, views of the B2H Project would be mostly screened from view but where visible, the upper portions of the transmission lines structures would be the primary element in view. Further to the south, including the areas near Tub Springs and

Alkali Springs, moderate impacts on the setting adjacent to contributing trail segments would occur as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats.

Trail-associated Cultural Sites. Views from the Pioneer Graves (south of Huntington) trail-associated cultural site would be minimally affected as the B2H Project (Link 4-30) would be screened by topography and located 1.5 miles away with an existing 138-kV transmission line and I-84 located closer to the cultural site than the B2H Project. Views from Pioneer Graves near Farewell Bend and the Olds Ferry Site would be moderately affected by the B2H Project (Link 4-75) through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing in proximity to an existing 138-kV transmission line and I-84. Views of the B2H Project from these sites would be partially screened by riparian vegetation adjacent to the Snake River but where visible, the proposed transmission line structures would be mostly backdropped by arid rolling hills. The application of selective mitigation measures to route construction access roads to minimize earthwork and use overland construction techniques where possible would lessen these impacts but remain at a moderate impact level. Views of the B2H Project from Birch Creek trail-associated cultural site would be unobstructed and dominate the site's setting including views of skylined transmission line structures. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a high impact level as there are limited opportunities to screen the proposed transmission line structures. Views from the Tub Springs trail-associated cultural site (Oregon Trail ACEC – Tub Mountain) would be moderately affected by the B2H Project. Views of the B2H Project would be screened from view by Tub Mountain, and a hill east of the site, until Alkali Gulch where views of backdropped transmission line structures would occur approximately 2 miles away in Alkali Flats. Views from the Mud Springs trail-associated cultural site (Oregon Trail ACEC – Tub Mountain) would be moderately affected by the B2H Project as the B2H Project would be viewed 1.5 miles away with the transmission line structures backdropped by a ridge along the south edge of Alkali Flats.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, arid rolling hills west of Huntington and Farewell Bend, and in Alkali Flats, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Willow Creek Alternative

Trail Management

High Potential Historic Sites. Views from the Farewell Bend High Potential Historic Site would be minimally affected by the B2H Project (Link 4-40) located approximately 3 miles away with I-84 and an existing 138-kV transmission line located closer to the site than the B2H Project.

High Potential Historic Route Segments. Views of the B2H Project from the Alkali Springs High Potential Historic Route Segment would be mostly screened by McCarthy Ridge. Where visible, the

upper portions of the transmission lines structures would be the primary element in view and located more than 2.5 miles away, resulting in short duration views of the B2H Project (Link 4-40) minimally affecting the Alkali Springs High Potential Historic Route Segment.

Auto Tour Routes. The Willow Creek Alternative is located in proximity to the NPS auto tour route between the communities of Dixie and Huntington. South of Dixie the B2H Project (Link 4-13) would parallel the NPS auto route for approximately 6 miles adjacent to an existing 138-kV transmission line. In this area, the Oregon NHT congressional alignment parallels the auto tour route increasing opportunities to interpret the trail setting and have a vicarious experience traveling along I-84. Due to the impacts on the intended experience of the trail and the scale of the B2H Project when compared to the existing cultural modifications, the B2H Project would dominate these views. Unobstructed views of skylined, to partially skylined, transmission structures located on each ridge with the construction of access roads to each structure would highly impact views from the auto tour route. The application of selective mitigation measures to route construction access roads to minimize earthwork would lessen these impacts but remain at a high impact level. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-513.

Nature and Purpose. Between the communities of Dixie and Huntington, the B2H Project would compromise the trail's nature and purpose by dominating views from the NPS auto tour route. Due to these impacts, additional compensatory mitigation would be required to offset these effects to avoid substantially interfering with the trail's nature and purpose (refer to Appendix C).

Scenic and Recreation Resources

Under the Willow Creek Alternative, the addition of the B2H Project would modify the trail setting in typical landscape settings in Burnt River Canyon, characterized by steep, rocky canyon walls with a narrow riparian corridor meandering through the canyon contrasting with the arid adjacent lands, which have been influenced by an existing 138-kV transmission line and I-84. The application of selective mitigation measures including overland construction in level terrain and in mountainous terrain, the minimization of vegetation clearing and limiting earthwork associated with the construction of access roads, would reduce these effects to the extent practicable.

Impacts on the NPS auto tour route are described above in the Trail Management section. Views from the Farewell Bend State Recreation Area (Visual Resource KOP #5-13) would be minimally affected by the B2H Project located approximately 3 miles away with I-84 and an existing 138-kV transmission line located closer to the site than the B2H Project. The B2H Project would minimally affect views from the Birch Creek Interpretive Site (Visual Resource KOP #8-3) within the Oregon Trail ACEC – Birch Creek portion due to topographic screening and the B2H Project being located more than 3 miles away. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-512.

Historic and Cultural Resources

Contributing Trail Segments. Under the Willow Creek Alternative, no contributing trail segment would be crossed by the B2H Project. The B2H Project (Link 4-13) would moderately affect the setting

associated with contributing segments north of Huntington where a 138-kV transmission line and I-84 have modified the existing setting. The application of selective mitigation measures to first limit the construction of access roads, and if necessary, route access roads to minimize earthwork, would lessen these impacts but remain at a moderate impact level. For miles of the contributing trail traces with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-514.

Trail-associated Cultural Sites. Views from the Pioneer Graves (south of Huntington) trail-associated cultural site would be minimally affected as the B2H Project would be screened by topography and located 2.5 miles away with an existing 138-kV transmission line and I-84 located closer to the cultural site than the B2H Project. Views from Pioneer Graves near Farewell Bend and the Olds Ferry Site would be also be minimally affected by the B2H Project as the B2H Project would be located more than 3 miles beyond an existing 138-kV transmission line and I-84. Views from the Birch Creek trail-associated cultural site would be minimally affected by the B2H Project due to topography screening and the B2H Project being located more than 3 miles away.

Biological, Natural, and Other Resources

The B2H Project would modify characteristic vegetation communities associated with the Oregon NHT, including grassland and shrubland dominated landscapes in the Burnt River Canyon, through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing the extent practicable.

Conclusions

All alternatives, and route variations, would highly impact views from the NPS auto tour route north of Huntington. The Applicant's Proposed Alternative would have minimal impacts on other trail resources as it turns to the west away from Farewell Bend and Tub Mountain. The Tub Mountain South Alternative would highly impact views from the Birch Creek Interpretive Site, located in the Oregon Trail ACEC – Birch Creek portion, as well as views from the adjacent contributing trail segments and the Alkali Springs High Potential Route Segment farther to the south. The Willow Creek Alternative would continue to parallel the NPS auto tour route, in the middleground distance zone, generating moderate impacts on views until turning to the west to avoid Birch Creek and Tub Mountain. All alternatives would require compensatory mitigation for high impacts on views from the NPS auto tour route, in addition the Tub Mountain South Alternative would highly impact views from the Alkali Springs High Potential Route Segment and Oregon Trail ACEC – Birch Creek portion. Without successful implementation of compensatory mitigation measures to offset these high residual impacts, the B2H Project would substantially interfere with the trail's nature and purpose (refer to Appendix C).

Segment 5—Malheur

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Four tables provide quantification and summary of effects on trail resources associated with each alternative and route variation. Note, since there are no trail management

components located in the study corridor, no high residual impacts on federal protection components were identified.

- Table 3-515 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-516 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-517 presents the information on visibility of the B2H Project visible associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Note, the NPS auto tour route and no contributing trail traces are located in the trail-specific study corridors in Segment 5. Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-515. Oregon National Historic Trail Summary of Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.4	11.9	0.0	0.0	11.9
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*2.5*	*2.5*	*0.0*	*0.0*	*2.5*
Variation S5-B2	*2.8*	*2.8*	*0.0*	*0.0*	*2.8*
Malheur S	43.5	5.4	0.0	0.0	5.4
Malheur A	43.1	1.9	0.0	0.0	1.9

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-516. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 5—Malheur			
Alternative Route	**Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area**	**Total Miles of Congressional Alignment with Views of the B2H Project Components**	**Total Number of Congressional Alignment Crossings**
Applicant's Proposed Action	11.8	10.0	0
Variation S5-A1	*0.0*	*0.0*	*0*
Variation S5-A2	*0.0*	*0.0*	*0*
Variation S5-B1	*8.8*	*2.5*	*0*
Variation S5-B2	*9.7*	*2.5*	*0*
Malheur S	2.9	2.4	0
Malheur A	0.5	0.0	0

Table 3-517. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 5—Malheur					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	40.4	0.0	0.0	11.8	0.0
Variation S5-A1	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	2.5	0.0	*0.0*	2.6	*0.0*
Variation S5-B2	2.8	0.0	*0.0*	2.8	*0.0*
Malheur S	43.5	0.0	0.0	5.3	0.0
Malheur A	43.1	0.0	0.0	1.7	0.0

Applicant's Proposed Action Alternative

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 5-70) would modify the trail setting approximately 2 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail segments, high potential historic sites or segments are located in the trail-specific study area) and the conversion of the landscapes adjacent to the Snake River to agricultural uses, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources were identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 2 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variations S5-A1 and S5-A2

These variations are not located in proximity to the Oregon NHT.

Variation S5-A2

This variation is not located in proximity to the Oregon NHT.

Variation S5-B1

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 5-65) would modify the trail setting approximately 3 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail traces, high potential historic sites or segments are located in the trail-specific study area), the conversion of the landscapes adjacent to the Snake River to agricultural uses, and partial topographic screening and backdropping opportunities from Blackjack Butte, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 3 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variation S5-B2

This variation would have similar minimal impacts on the Oregon NHT as described for Variation S5-B1 since both variations are located more than 3 miles away from trail-associated resources.

Malheur S Alternative

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Malheur S Alternative, the addition of the B2H Project (Link 5-30) would modify the trail setting approximately 4 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail traces, high potential historic sites or segments are located in the trail-specific study area) the conversion of the landscapes adjacent to the Snake River to agricultural uses, and partial topographic screening and backdropping opportunities from Blackjack Butte, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 4 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Malheur A Alternative

Trail Management

No identifiable impacts on trail management were identified for the Applicant's Proposed Action Alternative as no high potential historic sites, high potential historic segments, or the NPS auto tour route are located in the study corridor.

Scenic and Recreation Resources

Under the Malheur A Alternative, the addition of the B2H Project (Link 5-35) would modify the trail setting approximately 5 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT congressional alignment (note: no contributing trail traces, high potential historic sites or segments are located in the trail-specific study area) the conversion of the landscapes adjacent to the Snake River to agricultural uses, and partial topographic screening and backdropping

opportunities from Blackjack Butte, the B2H Project would minimally affect the trail setting in this area. No trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, approximately 5 miles, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Conclusions

Since there are no high potential historic sites, high potential historic segments, portions of the NPS auto tour route, or contributing trail segments located in the trail-specific study area for the Oregon NHT, the alternatives would minimally impact the Oregon NHT. The congressional alignment is located approximately 2 miles east of the Applicant's Proposed Action Alternative, which due to the distance and conversion of the landscapes adjacent to the Snake River to agricultural uses, the B2H Project would minimally affect the trail setting in this area

Segment 6—Treasure Valley

This section presents the estimated effects of the B2H Project on the Oregon NHT by alternative route and route variation. Four tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-518 identifies each alternative and route in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Oregon NHT.
- Table 3-519 provides information relevant to trail management and presents the (1) miles of the Oregon NHT congressional alignment located in the study corridor, (2) total miles of the Oregon NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Oregon NHT congressional alignment for each alternative and route variation.
- Table 3-520 identifies the specific trail management components (federal protection components) where high residual effects were identified for each alternative and route variation. These components include NPS high potential historic sites, NPS high potential route segments, and BLM ACECs.
- Table 3-521 presents the information on visibility of the B2H Project visible associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Note, the NPS auto tour route and no contributing trail traces are located in the trail-specific study corridors in Segment 6. Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-518. Oregon National Historic Trail Summary of Residual Impacts for Segment 6—Treasure Valley

Alternative Route	Total Length (miles)	Extent in Oregon National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	28.0	15.0	0.0	0.0	15.0
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*12.2*	*0.0*	*0.0*	*12.2*
Variation S6-B2	*14.1*	*11.5*	*0.0*	*0.0*	*11.5*

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-519. Oregon National Historic Trail Congressional Alignment Inventory Data for Segment 6—Treasure Valley

Alternative Route	Total Miles of Congressional Alignment in the Oregon National Historic Trail Study Area	Total Miles of Congressional Alignment with Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	18.2	13.5	0
Variation S6-A1	*0.0*	*0.0*	*0*
Variation S6-A2	*0.0*	*0.0*	*0*
Variation S6-B1	*15.4*	*10.8*	*0*
Variation S6-B2	*14.9*	*11.1*	*0*

Table 3-520. Oregon National Historic High Residual Impacts on Trail Management Components for Segment 6—Treasure Valley

Alternative Route	High Potential Historic Sites[1]	High Potential Route Segments[1]	Areas of Critical Environmental Concern[1]
	Givens Hot Springs		
Applicant's Proposed Action	No	None	None
Variation S6-A1	–	*None*	*None*
Variation S6-A2	–	*None*	*None*
Variation S6-B1	*No*	*None*	*None*
Variation S6-B2	*No*	*None*	*None*

Table Note: [1]No direct residual impacts after application of selective mitigation measures, remaining impacts are on views from these trail management components

Table 3-521. Oregon National Historic Trail Project Visibility from Viewing Locations for Segment 6—Treasure Valley					
Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	28.0	0.0	0.0	14.9	4.1
Variation S6-A1	*9.3*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-A2	*8.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S6-B1	*14.4*	*0.0*	0.0	*12.1*	2.9
Variation S6-B2	*14.1*	*0.0*	0.0	*11.5*	3.6

Applicant's Proposed Action Alternative

Trail Management

No high potential route segments or the NPS auto tour routes are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Givens Hot Spring High Potential Historic Site would be minimally affected by the B2H Project (Link 6-25) due extent of existing modifications adjacent to the site including an existing 500-kV transmission line and the viewing distance, 2.5 miles away, which would generate a low level of visual contrast in this setting.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting 2.5 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT and the conversion of the landscapes adjacent to the Snake River to agricultural uses as well as an existing 500-kV transmission line, the B2H Project would minimally affect the trail setting in this area. Impacts on the Givens Hot Spring Campground (Visual Resource KOP #12-4), a trail-associated recreation area, is similar to those described for the associated high potential historic site. No other trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, 2.5 miles, an existing 500-kV transmission line located closer to the Oregon NHT, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variations S6-A1 and Variation S6-A2

These variations are not located in proximity to the Oregon NHT.

Variation S6-B1

Trail Management

No high potential route segments or the NPS auto tour routes are located in the trail-specific study corridor.

High Potential Historic Sites. Views from the Givens Hot Spring High Potential Historic Site would be minimally affected by the B2H Project (Link 5-65) due extent of existing modifications adjacent to the site including an existing 500-kV transmission line and the viewing distance, 2.5 miles away, which would generate a low level of visual contrast in this setting.

Scenic and Recreation Resources

Under Variation S6-B1, the addition of the B2H Project would modify the trail setting 2.5 miles west of the trail through the introduction of transmission line structures, right-of-way vegetation clearing, and the construction of access roads in arid, rolling hills. Due to the distance from the Oregon NHT and the conversion of the landscapes adjacent to the Snake River to agricultural uses as well as an existing 500-kV transmission line, the B2H Project would minimally affect the trail setting in this area. Impacts on the Givens Hot Spring Campground (Visual Resource KOP #12-4), a trail-associated recreation area, is similar to those described for the associated high potential historic site. No other trail-associated recreation areas were identified in the trail-specific study corridor.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified as no contributing trail traces or trail-associated cultural sites are located in the trail-specific study corridor.

Biological, Natural, and Other Resources

The grassland and shrubland vegetation communities west of the Oregon NHT would be modified through geometric right-of-way vegetation clearing but due to the distance from the Oregon NHT, 2.5 miles, an existing 500-kV transmission line located closer to the Oregon NHT, and the intermittent screening of the ground along the right-of-way, these vegetation communities would be minimally affected as related to the Oregon NHT.

Variation S6-B2

Impacts on the Oregon NHT would be similar but lower in magnitude than those associated with Variation S6-B1 due to the increase distance between the Oregon NHT and the B2H Project along Link 6-30.

Conclusions

Impacts on the Oregon NHT, including the Givens Hot Spring high potential historic site, would be minimal since the Segment 6 routes parallel an existing 500-kV transmission line and trail resources are located more than 2 miles away from the routes.

LEWIS AND CLARK NATIONAL HISTORIC TRAIL

Segment 1—Morrow-Umatilla

The section presents the estimated effects of the B2H Project on the Lewis and Clark NHT by alternative route and route variations. Four tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-522 identifies each alternative and route variation in the trail-specific study corridor and the estimated levels of residual effects (i.e., high, moderate, and low) on the Lewis and Clark NHT.
- Table 3-523 provides information relevant to trail management and presents the (1) miles of the Lewis and Clark NHT congressional alignment located in the study corridor, (2) total miles of the Lewis and Clark NHT congressional alignment with views of the B2H Project, and (3) total number of crossings of the Lewis and Clark NHT congressional alignment for each alternative and route variation.
- Table 3-524 presents the information on visibility of the B2H Project, associated with each alternative and route variation as viewed from trail-associated viewing locations within the foreground and middleground distance zones.
- To further quantify the visibility from the NPS auto tour route, Table 3-525 identifies the extent of the auto tour route in the study corridors with views of the B2H Project in both the foreground and middleground distance zones.

Refer to map MV-25 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-522. Lewis and Clark National Historic Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Lewis and Clark National Historic Trails Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	4.2	0.0	1.5	2.7
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	4.2	0.0	1.5	2.7
Applicant's Proposed Action – Southern Route	99.1	4.2	0.0	1.5	2.7
West of Bombing Range Road – Southern Route	95.6	4.2	0.0	1.5	2.7
Longhorn	88.2	3.7	0.0	1.4	2.3
Interstate 84	84.7	3.2	0.0	1.4	1.8
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	3.2	0.0	1.4	1.8

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-523. Lewis and Clark National Historic Trail Congressional Alignment Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Congressional Alignment in the Lewis and Clark National Historic Trail Study Area	Total Miles of Congressional Alignment with Potential Views of the B2H Project Components	Total Number of Congressional Alignment Crossings
Applicant's Proposed Action	8.4	8.1	0
Variation S1-B1	*0.0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0.0*	*0*
East of Bombing Range Road	8.4	8.1	0
Applicant's Proposed Action – Southern Route	8.4	8.1	0
West of Bombing Range Road – Southern Route	8.4	8.1	0
Longhorn	8.3	7.7	0
Interstate 84	8.3	7.6	0
Variation S1-A1	*0.0*	*0.0*	*0*
Variation S1-A2	*0.0*	*0.0*	*0*
Interstate 84 – Southern Route	8.3	7.6	0

Table 3-524. Lewis and Clark National Historic Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	91.9	1.2	1.2	2.9	2.9
Variation S1-B1	6.4	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	6.4	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	1.2	1.2	2.9	2.9
Applicant's Proposed Action – Southern Route	99.1	1.2	1.2	2.9	2.9
West of Bombing Range Road – Southern Route	95.6	1.2	1.2	2.9	2.9
Longhorn	88.2	1.1	1.1	2.6	2.6
Interstate 84	84.7	1.1	1.1	2.1	2.1
Variation S1-A1	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	1.1	1.1	2.1	2.1

Table 3-525. Lewis and Clark National Historic Trail Project Visibility from Auto Tour Route for Segment 1—Morrow-Umatilla				
Alternative Route	Extent in Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Middleground (0.5 to 5.0 miles) Distance Zone	
	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project	Miles of Auto Tour Route	Miles with Potential Views of the B2H Project
Applicant's Proposed Action	1.0	1.0	9.7	9.5
Variation S1-B1	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	1.0	1.0	9.7	9.5
Applicant's Proposed Action – Southern Route	1.0	1.0	9.7	9.5
West of Bombing Range Road – Southern Route	1.0	1.0	9.7	9.5
Longhorn	1.0	1.0	9.9	9.5
Interstate 84	1.0	1.0	10.5	10.0
Variation S1-A1	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	1.0	1.0	10.5	10.0

Applicant's Proposed Action Alternative

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 2 miles away, as well as the extent of existing modifications located between the Columbia River and the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 1-1) would have minimal effects on the Lewis and Clark NHT alignment. Views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Moderate impacts would occur on views from the NPS auto tour route where the B2H Project (Link 1-3) crosses near the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line but due to the height of the transmission line structures, the B2H Project would attract attention from motorists on the NPS auto tour route.

Through the application of selective mitigation measures, including the use of overland construction techniques and maximizing the transmission line span across the auto tour route, the intended experience of the trail would be affected but not substantially compromised. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-525.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-524.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 2 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Lewis and Clark NHT.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 3 miles away, as well as the extent of existing modifications located between the Columbia River and the additional action, the addition of the Connection Action would have minimal effects on Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Low impacts would occur on views from the NPS auto tour route where the additional action starts a 0.5 mile south of the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line, the additional action would be of similar scale and would be subordinate in the views from the NPS auto tour route.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

East of Bombing Range Road Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Applicant's Proposed Action Alternative since the two alternatives are located within 500 feet of each other in proximity to trail resources.

Applicant's Proposed Action – Southern Route Alternative

This alternative would have the same impacts on the Lewis and Clark NHT as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 3 miles away, as well as the extent of existing modifications located between the Columbia River and the additional action, the addition of the Connection Action would have minimal effects on Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Low impacts would occur on views from the NPS auto tour route where the additional action starts a 0.5 mile south of the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line, the additional action would be of similar scale and would be subordinate in the views from the NPS auto tour route.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

West of Bombing Range Road – Southern Route Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 3 miles away, as well as the extent of existing modifications located between the Columbia River and the additional action, the addition of the Connection Action would have minimal effects on the Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Low impacts would occur on views from the NPS auto tour route where the additional action starts a 0.5 mile south of the intersection of U.S. Highway 730 and I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line, the additional action would be of similar scale and would be subordinate in the views from the NPS auto tour route.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, the impacts on trail setting would be low in magnitude.

Impacts on views from Boardman Park and the NPS auto tour route are described in the Trail Management section.

Historic and Cultural Resources

Since no additional cultural resource sites or trail segments associated with the Lewis and Clark NHT were identified, beyond those described in Trail Management, the effects on historic and cultural resources are the same as those described in the Trail Management section.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Lewis and Clark NHT due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail including the substantial modification of the river corridor through damming of the river.

Longhorn Alternative

Trail Management

Due to the distance from the Columbia River (outbound and return route), more than 2 miles away, as well as the extent of existing modifications located between the Columbia River and the Longhorn Alternative, the addition of the B2H Project (Link 1-5) would have minimal effects on the Lewis and Clark NHT alignment. Additionally views from Boardman Park, identified as a trail-associated site, also would be minimally affected due to the B2H Project being located approximately 4 miles away with a similar level of existing modifications in the area.

Moderate impacts would occur on views from the NPS auto tour route where the B2H Project (Link 1-9) crosses U.S. Highway 730 approximately one mile north of the intersection with I-84. The adjacent area has been modified by existing utility development, highways, irrigated agricultural uses, the existing highways, and the railroad line but due to the height of the transmission line structures, the B2H Project would attract attention from motorists on the NPS auto tour route. Through the application of selective mitigation measures, including the use of overland construction techniques and maximizing the transmission line span across the auto tour route, the intended experience of the trail would be affected but not substantially compromised. For miles of the NPS auto tour route alignment with views of the B2H Project in the foreground and middleground distance zones, refer to Table 3-525.

Scenic and Recreation Resources

The Longhorn Alternative would have similar impacts on the scenic and recreation resources associated with Lewis and Clark NHT as the Applicant's Proposed Action Alternative. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from all trail-associated viewing locations is quantified in Table 3-524.

Historic and Cultural Resources

The Longhorn Alternative would have similar impacts on the historic and cultural resources associated with Lewis and Clark NHT as the Applicant's Proposed Action Alternative.

Biological, Natural, and Other Resources

This alternative would have similar impacts on the biological, natural, and other resources associated with Lewis and Clark NHT as the Applicant's Proposed Action Alternative.

Interstate 84 Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Longhorn Alternative since the two alternatives share the same alignment in proximity to trail resources, with the Interstate 84 Alternative turning east to parallel the interstate where low impacts were identified.

Interstate 84 – Southern Route Alternative

This alternative would have similar impacts on the Lewis and Clark NHT as the Longhorn Alternative since the two alternatives share the same alignment in proximity to trail resources, with the Interstate 84 Alternative – Southern Route Alternative turning east to parallel the interstate where low impacts were identified.

Conclusions

All alternative routes would moderately affect and cross the Lewis and Clark National Historic Trail auto tour route near the intersection of U.S. Highway 730 and Interstate 84. The congressional trail alignment is located more than 2 miles away, the Columbia River, and, since the B2H Project is located adjacent to existing modifications, this component of the NHT would be affected minimally by the B2H Project.

Impacts on the auto tour route are similar for all routes with the routes along the Bombing Range Road crossing at the U.S. Highway 730 and Interstate 84 intersection, whereas Longhorn and the I-84 alternatives cross both of these highways north and east, respectively, of the intersection.

UPPER COLUMBIA RIVER ROUTE STUDY TRAIL

Segment 1—Morrow-Umatilla

This section presents the estimated effects of the B2H Project on the Upper Columbia River Route Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-526 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Upper Columbia River Route Study Trail.
- Table 3-527 provides information relevant to trail management and presents the (1) miles of the Upper Columbia River Route Study Trail alignment located in the study corridor, (2) total miles of the Upper Columbia River Route Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Upper Columbia River Route Study Trail alignment for each alternative and route variation.

- Table 3-528 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-526. Upper Columbia River Route Study Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Upper Columbia River Route Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	4.1	0.0	0.0	4.1
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	4.4	0.0	0.0	4.1
Applicant's Proposed Action – Southern Route	99.1	4.1	0.0	0.0	4.1
West of Bombing Range Road – Southern Route	95.6	4.4	0.0	0.0	4.1
Longhorn	88.2	3.6	0.0	0.0	3.6
Interstate 84	84.7	3.2	0.0	0.0	3.2
Variation S1-A1	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	*18.5*	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	3.2	0.0	0.0	3.2

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-527. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments in the Upper Columbia River Route Trail Study Area	Total Miles of Study Alignments with Potential Views of the B2H Project Components	Total Number of Study Alignment Crossings
Applicant's Proposed Action	8.4	8.2	0
Variation S1-B1	*0.0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0.0*	*0*
East of Bombing Range Road	8.4	8.2	0
Applicant's Proposed Action – Southern Route	8.4	8.2	0
West of Bombing Range Road – Southern Route	8.4	8.2	0
Longhorn	8.3	7.8	0

Table 3-527. Upper Columbia River Route Study Trail Inventory Data for Segment 1—Morrow-Umatilla			
Alternative Route	**Total Miles of Study Alignments in the Upper Columbia River Route Trail Study Area**	**Total Miles of Study Alignments with Potential Views of the B2H Project Components**	**Total Number of Study Alignment Crossings**
Interstate 84	8.3	7.7	0
Variation S1-A1	*0.0*	*0.0*	*0*
Variation S1-A2	*0.0*	*0.0*	*0*
Interstate 84 – Southern Route	8.3	7.7	0

Table 3-528. Upper Columbia River Route Study Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	91.9	0.0	0.0	4.0	4.0
Variation S1-B1	6.4	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	6.4	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	0.0	4.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	4.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	4.0	4.0
Longhorn	88.2	0.0	0.0	3.7	3.5
Interstate 84	84.7	0.0	0.0	3.2	3.2
Variation S1-A1	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-A2	18.5	*0.0*	*0.0*	*0.0*	*0.0*
Interstate 84 – Southern Route	93.4	0.0	0.0	3.2	3.2

Applicant's Proposed Action Alternative

Trail Management

Due to the distance from this study trail, more than 2 miles away, as well as the extent of existing modifications located between the trail and the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 1-1) would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from the NPS study trail alignment is quantified in Table 3-528.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to the distance from the study trail, more than 2 miles away, and the extent of existing change already in the landscape adjacent to the trail.

Variations S1-B1 and Variation S1-B2

These variations are not located in proximity to the Upper Columbia River Route Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

East of Bombing Range Road Alternative

This alternative would have similar impacts on the Upper Columbia River Route Study Trail as the Applicant's Proposed Action Alternative since the two alternatives are located within 500 feet of each other in proximity to trail resources.

Applicant's Proposed Action – Southern Route Alternative

This alternative would have similar impacts on the Upper Columbia River Route Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

West of Bombing Range Road – Southern Route Alternative

This alternative would have similar impacts on the Upper Columbia River Route Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Upper Columbia River Route Study Trail due to

the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

Longhorn Alternative

This alternative would have similar low impacts on the Upper Columbia River Route Study Trail (Link 1-5) as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting.

Interstate 84 Alternative

This alternative would have similar low impacts on the Upper Columbia River Route Study Trail (Link 1-5) as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting.

Interstate 84 – Southern Route Alternative

This alternative would have similar low impacts on the Upper Columbia River Route Study Trail (Link 1-5) as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting.

Conclusions

All alternative routes would minimally affect the study trail since the B2H Project is located more than 2 miles away from the study trail alignment and in proximity to existing modifications. The addition of the B2H Project would not compromise the potential designation of the trail.

UMATILLA RIVER ROUTE AND COLUMBIA RIVER TO THE DALLES STUDY TRAIL

Segment 1—Morrow-Umatilla

This section presents the estimated effects of the B2H Project on the Umatilla River Route and Columbia River to The Dalles Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-529 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Umatilla River Route and Columbia River to The Dalles Study Trail.
- Table 3-530 provides information relevant to trail management and presents the (1) miles of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment located in the study corridor, (2) total miles of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Umatilla River Route and Columbia River to The Dalles Study Trail alignment for each alternative and route variation.
- Table 3-531 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-529. Umatilla River Route and Columbia River to The Dalles Study Trail Summary of Residual Impacts for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Umatilla River Route and Columbia River to The Dalles Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	91.9	4.1	0.0	0.0	4.1
Variation S1-B1	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	*6.4*	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	4.1	0.0	0.0	4.1
Applicant's Proposed Action – Southern Route	99.1	4.1	0.0	0.0	4.1
West of Bombing Range Road – Southern Route	95.6	4.1	0.0	0.0	4.1
Longhorn	88.2	3.6	0.0	0.0	3.6
Interstate 84	84.7	17.3	0.0	1.1	16.2
Variation S1-A1	*18.5*	*5.3*	*0.0*	*0.1*	*5.2*
Variation S1-A2	*18.5*	*6.4*	*0.0*	*0.4*	*6.0*
Interstate 84 – Southern Route	93.4	17.3	0.0	1.1	16.2

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-530. Umatilla River Route and Columbia River to The Dalles Study Trail Inventory Data for Segment 1—Morrow-Umatilla

Alternative Route	Total Miles of Study Alignments in the Umatilla River Route and Columbia River to The Dalles Trail Study Area	Total Miles of Study Alignments with Potential Views of the B2H Project Components	Total Number of Study Alignment Crossings
Applicant's Proposed Action	8.4	8.2	0
Variation S1-B1	*0.0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0.0*	*0*
East of Bombing Range Road	8.4	8.2	0
Applicant's Proposed Action – Southern Route	8.4	8.2	0
West of Bombing Range Road – Southern Route	8.4	8.2	0
Longhorn	8.3	7.8	0
Interstate 84	18.0	16.7	1
Variation S1-A1	*6.5*	*5.7*	*0*
Variation S1-A2	*6.5*	*5.7*	*0*
Interstate 84 – Southern Route	18.0	16.7	1

Table 3-531. Umatilla River Route and Columbia River to The Dalles Study Trail Project Visibility from Viewing Locations for Segment 1—Morrow-Umatilla

Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	91.9	0.0	0.0	4.0	4.0
Variation S1-B1	6.4	*0.0*	*0.0*	*0.0*	*0.0*
Variation S1-B2	6.4	*0.0*	*0.0*	*0.0*	*0.0*
East of Bombing Range Road	92.3	0.0	0.0	4.0	4.0
Applicant's Proposed Action – Southern Route	99.1	0.0	0.0	4.0	4.0
West of Bombing Range Road – Southern Route	95.6	0.0	0.0	4.0	4.0
Longhorn	88.2	0.0	0.0	3.7	3.5
Interstate 84	84.7	1.2	1.2	16.0	15.6
Variation S1-A1	18.5	*0.2*	*0.2*	*5.1*	*4.7*
Variation S1-A2	18.5	*0.4*	*0.4*	*5.9*	*5.0*
Interstate 84 – Southern Route	93.4	1.2	1.2	16.0	15.6

Applicant's Proposed Action Alternative

Trail Management

Due to the distance from this study trail, more than 2 miles away, as well as the extent of existing modifications located between the trail and the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 1-1) would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from the NPS study trail alignment is quantified in Table 3-531.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Umatilla River Route and Columbia River to The Dalles Study Trail due to the distance from the study trail, more than 2 miles away, and the extent of existing change already in the landscape adjacent to the trail.

Variations S1-B1 and S1-B2

These variations are not located in proximity to the Umatilla River Route and Columbia River to The Dalles Study Trail.

Additional Action – 69-Kilovolt Line Replacement

Design Options 1, 2, and 3

Trail Management

Due to the distance from this study trail, more than 3 miles away, as well as the extent of existing modifications located between the trail and the additional action, the addition of the additional action would not compromise the potential designation of the trail as an NHT.

Scenic and Recreation Resources

The addition of the additional action would further modify the trail's setting but due to the overall extent of adjacent modifications including transmission lines, industrial uses, and the conversion of lands to agricultural uses, these impacts would be low in magnitude.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The modification of vegetation communities through construction of access roads and right-of-way vegetation clearing would be minor as viewed from the Umatilla River Route and Columbia River to The Dalles Study Trail due to the distance from the study trail, more than 3 miles away, and the extent of existing change already in the landscape adjacent to the trail.

East of Bombing Range Road Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Applicant's Proposed Action Alternative since the two alternatives are located within 500 feet of each other in proximity to trail resources.

Applicant's Proposed Action – Southern Route Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

West of Bombing Range Road – Southern Route Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment in proximity to trail resources.

Longhorn Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River (Link 1-5) to The Dalles Study Trail as the Applicant's Proposed Action Alternative since both alternatives are viewed from more than 2 miles away adjacent to existing modifications in a similar landscape setting..

Interstate 84 Alternative

Trail Management

Impacts on trail management for the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail along the Columbia River (Link 1-5) would be the same as the Applicant's Proposed Action Alternative. In the location where the Interstate 84 Alternative (Link 1-23) crosses the Umatilla River portion of the trail, adjacent to U.S. Highway 395, the introduction of the transmission line structures, construction access roads, and right-of-way vegetation clearing could influence the potential designation of the trail as an NHT. Through the application of selective mitigation measures, including the use of overland construction techniques and maximizing the transmission line span across the trail, the effects on potential designation would be minimized to the extent practicable.

Scenic and Recreation Resources

Impacts on scenic and recreation resources for the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail along the Columbia River would be the same as the Applicant's Proposed Action Alternative. Long-term effects on the Umatilla River portion of the Study Trail resulting from the introduction of the B2H Project, associated with the Interstate 84 Alternative, would be mostly limited to the presence of transmission line towers since the lands adjacent to the trail are in agricultural use and would quickly revegetate, limiting the effects of construction access roads and right-of-way vegetation clearing. Additionally through the application of selective mitigation measures described above, these impacts would be further reduced to the extent practicable. The overall extent of the B2H Project that would be visible within the foreground and middleground distance zones from the NPS study trail alignment is quantified in Table 3-531.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

Impacts on biological, natural, and other resources for the portion of the Umatilla River Route and Columbia River to The Dalles Study Trail along the Columbia River would be the same as the Applicant's Proposed Action Alternative. In the location where the Interstate 84 Alternative crosses the Umatilla River portion of the trail, impacts on vegetation communities would be minor since the B2H Project mostly traverses agricultural lands, which are not consistent with the trail's period of significance, and revegetate quickly, reducing the long-term effects associated with the B2H Project.

Interstate 84 – Southern Route Alternative

This alternative would have similar impacts on the Umatilla River Route and Columbia River to The Dalles Study Trail as the Interstate 84 Alternative since the two alternatives share the same alignment in proximity to trail resources.

Conclusions

The Applicant's Proposed Action Alternative, East of Bombing Range Road Alternative, Applicant's Proposed Action – Southern Route Alternative, West of Bombing Range Road – Southern Route Alternative, and Longhorn Alternative would minimally affect the study trail due to the B2H Project being

located more than 2 miles away from the trail study alignment and in proximity to existing modifications. The Interstate 84 and Interstate 84 – Southern Route Alternative would moderately impact the study trail north of the community of Echo along the Umatilla River portion of the trail. Through the application of selective mitigation measures, the effects on the potential designation of the trail would be minimized to the extent practicable.

GOODALE'S CUTOFF STUDY TRAIL

Segment 3—Baker Valley

This section presents the estimated effects of the B2H Project on the Goodale's Cutoff Study Trail by alternative and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-532 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Goodale's Cutoff Study Trail.
- Table 3-533 provides information relevant to trail management and presents the (1) miles of the Goodale's Cutoff Study Trail alignment located in the study corridor, (2) total miles of the Goodale's Cutoff Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Goodale's Cutoff Study Trail alignment for each alternative and route variation.
- Table 3-534 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-532 Goodale's Cutoff Study Trail Summary of Residual Impacts for Segment 3— Baker Valley

Alternative Route	Total Length (miles)	Extent in Goodale's Cutoff Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	55.2	13.0	2.9	2.8	7.3
Variation S3-A1	*12.4*	*0.4*	*0.0*	*0.0*	*0.4*
Variation S3-A2	*12.2*	*0.4*	*0.0*	*0.0*	*0.4*
Variation S3-B1	*13.9*	*12.6*	*2.9*	*2.8*	*6.9*
Variation S3-B2	*14.4*	*10.3*	*0.0*	*0.6*	*9.7*
Variation S3-B3	*14.7*	*10.3*	*0.0*	*0.6*	*9.7*
Variation S3-B4	*14.3*	*9.9*	*0.0*	*0.0*	*9.9*
Variation S3-B5	*14.0*	*9.9*	*0.0*	*0.0*	*9.9*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*0.0*

Table 3-532 Goodale's Cutoff Study Trail Summary of Residual Impacts for Segment 3— Baker Valley

Alternative Route	Total Length (miles)	Extent in Goodale's Cutoff Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*0.0*
Flagstaff A	55.3	10.3	0.0	0.0	10.3
Timber Canyon	70.3	24.5	8.8	5.3	10.4
Flagstaff A – Burnt River Mountain	55.3	10.3	0.0	0.0	10.3
Flagstaff B	56.0	10.7	0.0	0.6	10.1
Flagstaff B – Burnt River West	55.7	10.7	0.0	0.6	10.1
Flagstaff B – Durkee	59.6	10.7	0.0	0.6	10.1

Table Note: [1]Due to impacts only being analyzed in the trail-specific study areas, the total miles crossed will not equal the total length of the alternative routes and variations.

Table 3-533. Goodale's Cutoff Study Trail Inventory Data for Segment 3—Baker Valley

Alternative Route	Total Miles of Study Alignments in the Goodale's Cutoff Trail Study Area	Total Miles of Study Alignments with Views of the B2H Project Components	Total Number of Study Alignment Crossings
Applicant's Proposed Action	21.2	15.5	2
Variation S3-A1	*1.5*	*0.0*	*0*
Variation S3-A2	*1.5*	*0.0*	*0*
Variation S3-B1	*21.2*	*15.5*	*2*
Variation S3-B2	*11.4*	*0.6*	*0*
Variation S3-B3	*11.4*	*0.6*	*0*
Variation S3-B4	*10.2*	*0.0*	*0*
Variation S3-B5	*10.1*	*0.0*	*0*
Variation S3-C1	*0.0*	*0.0*	*0*
Variation S3-C2	*0.0*	*0.0*	*0*
Variation S3-C3	*0.0*	*0.0*	*0*
Variation S3-C4	*0.0*	*0.0*	*0*
Variation S3-C5	*0.0*	*0.0*	*0*
Variation S3-C6	*0.0*	*0.0*	*0*
Flagstaff A	10.1	0.0	0
Timber Canyon	14.8	30.2	2
Flagstaff A – Burnt River Mountain	11.4	0.0	0
Flagstaff B	11.4	0.6	0
Flagstaff B – Burnt River West	11.4	0.6	0
Flagstaff B – Durkee	11.4	0.6	0

Table 3-534. Goodale's Cutoff Study Trail Project Visibility from Viewing Locations for Segment 3—Baker Valley					
Alternative Route	Total Length (miles)	Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone		Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone	
		Miles of the B2H Project	Potential Miles of the B2H Project Visible	Miles of the B2H Project	Potential Miles of the B2H Project Visible
Applicant's Proposed Action	55.2	1.5	1.5	11.3	6.6
Variation S3-A1	*12.4*	*0.0*	*0.0*	*0.3*	*0.0*
Variation S3-A2	*12.2*	*0.0*	*0.0*	*0.3*	*0.0*
Variation S3-B1	*13.9*	*1.5*	*1.5*	*11.0*	*6.6*
Variation S3-B2	*14.4*	*0.0*	*0.0*	*10.3*	*0.6*
Variation S3-B3	*14.7*	*0.0*	*0.0*	*10.3*	*0.6*
Variation S3-B4	*14.3*	*0.0*	*0.0*	*9.7*	*0.0*
Variation S3-B5	*14.0*	*0.0*	*0.0*	*9.7*	*0.0*
Variation S3-C1	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C2	*21.7*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C3	*21.1*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C4	*21.4*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C5	*21.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-C6	*24.7*	*0.0*	*0.0*	*0.0*	*0.0*
Flagstaff A	55.3	0.0	0.0	10.1	0.0
Timber Canyon	70.3	5.0	4.9	19.3	17.8
Flagstaff A – Burnt River Mountain	55.3	0.0	0.0	10.1	0.0
Flagstaff B	56.0	0.0	0.0	10.6	0.6
Flagstaff B – Burnt River West	55.7	0.0	0.0	10.6	0.6
Flagstaff B – Durkee	59.6	0.0	0.0	10.6	0.6

Applicant's Proposed Action Alternative

Trail Management

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 3-28) including skylined transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT for the area east of Flagstaff Hill as the B2H Project would dominate the trail's setting and cross both alignments of the Goodale's Cutoff. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, the effects on potential designation would be minimized to the extent practicable but these high impacts would remain where the Goodale's Cutoff Study Trail is crossed. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would dominate the trail setting east of Flagstaff Hill through the introduction of skylined transmission line structures on the ridgelines north and south of Virtue Flat in addition to the associated construction access roads and

right-of-way vegetation clearing. The existing modifications present, including the Virtue Flat ATV area and shooting range, have influenced the setting but due to the relative scale of the B2H Project compared to these modifications, the unobstructed views, and skylined transmission line structures, high impacts would occur in this area. The application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, would minimize these effects to the extent practicable but high impacts would remain.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Applicant's Proposed Action Alternative crosses arid grassland and shrubland landscapes in Virtue Flat and the B2H Project would modify these vegetation communities through geometric right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable in both the right-of-way and at the transmission line structure work areas.

Variations S3-A1 and S3-A2

Under these variations, the B2H Project would not be visible as views are screened by topography north of Virtue Flat (Table 3-534).

Variation S3-B1

Under this variation, the B2H Project (Link 3-28) would have the same impacts as the Applicant's Proposed Action Alternative as they share the same alignment in the trail-specific study corridor.

Variation S3-B2

Trail Management

Under this variation, the addition of the B2H Project (Link 3-37), including partially screened transmission line structures, could affect the potential designation for the portion of the trail where the B2H Project is visible for 0.6 mile west of Flagstaff Hill in context with an existing 230-kV transmission line. Due to the narrow siting opportunities between the sensitive Oregon NHT landscapes to the east and irrigated agricultural lands to the west, there are limited opportunities to relocate these structures to reduce impacts. Additional mitigation, including compensatory mitigation, would be required to offset these effects (Appendix C). Note, other variations for this segment include routes located further to the west in the irrigated agricultural lands.

Scenic and Recreation Resources

Under this variation, the addition of the B2H Project would attract attention through the introduction of transmission line structures partially screened by topography adjacent to Flagstaff Hill. Due to screening of the surface of the proposed B2H Project right-of-way, vegetation clearing and construction access roads would not be visible from the Goodale's Cutoff Study Trail. As described under Trail Management, there are limited opportunities to relocate the transmission line structures but other

variations in this segment are located further to the west where screening opportunities are more complete.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

This variation crosses arid grassland and shrubland landscapes west of Flagstaff Hill but due to topographic screening, the right-of-way vegetation clearing associated with constructing the B2H Project would not be visible from the Goodale's Cutoff Study Trail and, therefore, not affect this component of the trail.

Variation S3-B3

Under this variation, the B2H Project (Link 3-37) would have the same impacts as the Variation S3-B2 as they share the same alignment in the trail-specific study corridor.

Variation S3-B4

Under this variation, the B2H Project (Link 3-32) would not be visible as views are screened by topography west of Flagstaff Hill (Table 3-534).

Variation S3-B5

Under this variation, the B2H Project (Link 3-34) would not be visible as views are screened by topography north of Virtue Flat (Table 3-534).

Variations S3-C1 through S3-C6

These variations are not located in proximity to the Goodale's Cutoff Study Trail.

Flagstaff A Alternative

Under the Flagstaff A Alternative, the B2H Project (Link 3-34) would not be visible as views are screened by topography west of Flagstaff Hill (Table 3-534).

Timber Canyon Alternative

Trail Management

Under the Timber Canyon Alternative, the addition of the B2H Project (Link 3-8) including transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT west of the community of Richland as the B2H Project would dominate the trail's setting, cross both alignments of the Goodale's Cutoff, and parallel the trail for approximately 5 miles. This assessment includes impacts on both BLM-administered lands as well as adjacent private lands. Transmission line structures would be skylined on a ridge east of the trail with the distant Wallowa Mountains providing some backdropping opportunities to reduce the prominence of the structures, but due to the scale and proximity of the B2H Project, high impacts would occur on trail management. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the

trail, the effects on potential designation would be minimized to the extent practicable but these high impacts would remain where the Goodale's Cutoff Study Trail is crossed and paralleled. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C).

Scenic and Recreation Resources

Under the Timber Canyon Alternative, the addition of the B2H Project would dominate the trail setting in both Eagle Valley and northwest of Richland, near Eagle Creek, due to the relative scale of the B2H Project compared to the existing agricultural and transportation development present, resulting in high impacts. As described under Trail Management, transmission structures would be skylined on a ridge east of trail within the foreground distance zone (0 to 0.5 mile) and into the first 0.5 mile of the middleground distance zone (0.5 to 5 miles) with some backdropping opportunities from the distant Wallowa Mountains. Due to the grassland and shrubland vegetation in this area, views toward the B2H Project would be unobstructed except for a portion along the west side of Eagle Creek where the base of the structures would be screened by terrain. The application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, would minimize these effects to the extent practicable but high impacts would remain.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Timber Canyon Alternative crosses agricultural lands west of Richland, which would be minimally affected through the construction of the B2H Project as these vegetation communities are not consistent with the trail's period of significance, and revegetate quickly, reducing the long-term effects associated with the B2H Project. West of the community of Richland, the Timber Canyon Alternative crosses arid grassland and shrubland landscapes where the B2H Project would modify these vegetation communities through geometric right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable in both the right-of-way and at the transmission line structure work areas.

Flagstaff A – Burnt River Mountain Alternative

Under the Flagstaff A – Burnt River Mountain Alternative, the B2H Project (Link 3-34) would not be visible as views are screened by topography west of Flagstaff Hill (Table 3-534).

Flagstaff B Alternative

Trail Management

Under the Flagstaff B Alternative, the addition of the B2H Project (Link 3-37), including partially screened transmission line structures, could affect the potential designation for the portion of the trail where the B2H Project is visible for a 0.6 mile west of Flagstaff Hill in context with an existing 230-kV transmission line. Due to the narrow siting opportunities between the sensitive Oregon NHT landscapes

to the east and irrigated agricultural lands to the west, there are limited opportunities to relocate these structures to reduce impacts. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C). Note, other alternatives and route variations for this segment include routes located further to the west in the irrigated agricultural lands.

Scenic and Recreation Resources

Under the Flagstaff B Alternative, the addition of the B2H Project would attract attention through the introduction of transmission line structures partially screened by topography adjacent to Flagstaff Hill. Due to screening of the surface of the proposed B2H Project right-of-way, vegetation clearing and construction access roads would not be visible from the Goodale's Cutoff Study Trail. As described under Trail Management, there are limited opportunities to relocate the transmission line structures but other variations in this segment are located further to the west where screening opportunities are more complete.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Flagstaff B Alternative crosses arid grassland and shrubland landscapes west of Flagstaff Hill but due to topographic screening, the right-of-way vegetation clearing associated with constructing the B2H Project would not be visible from the Goodale's Cutoff Study Trail and, therefore, not affect this component of the trail.

Flagstaff B – Burnt River West Alternative

Under this Flagstaff B – Burnt River West Alternative, the B2H Project (Link 3-37) would have the same impacts as the Flagstaff B Alternative as they share the same alignment in the trail-specific study corridor.

Flagstaff B – Durkee

Under this Flagstaff B – Durkee Alternative, the B2H Project (Link 3-37) would have the same impacts as the Flagstaff B Alternative as they share the same alignment in the trail-specific study corridor.

Conclusions

Both the Applicant's Proposed Action Alternative and Timber Canyon Alternative would highly impact views from the study trail requiring compensatory mitigation to reduce effects on the trail's potential designation. The Applicant's Proposed Action Alternative, and Variation S3-B1, cross the study trail alignment east of the NHOTIC in an area with limited modifications in Virtue Flat. The Timber Canyon Alternative crosses the study trail alignment west of the community of Richland, adjacent to agricultural lands, where there are also limited modifications. Views of the study trail from Flagstaff A and Flagstaff A – Burnt River Mountains alternatives, and Variations S3-B3 and S3-B5, would be screened by topography. Views from the Goodale's Cutoff Study Trail would be moderately affected by the Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee alternatives, and Variations S3-B2 and S3-

B3, west of the NHOTIC along the edge of Baker Valley adjacent to an existing 230-kV transmission line.

OLDS FERRY ROAD STUDY TRAIL

Segment 4—Brogan

This section presents the estimated effects of the B2H Project on the Olds Ferry Road Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-535 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Olds Ferry Road Study Trail.
- Table 3-536 provides information relevant to trail management and presents the (1) miles of the Olds Ferry Road Study Trail alignment located in the study corridor, (2) total miles of the Olds Ferry Road Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Olds Ferry Road Study Trail alignment for each alternative and route variation.
- Table 3-537 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-535. Old Ferry Road Study Trail Summary of Residual Impacts for Segment 4—Brogan

Alternative Route	Total Length (miles)	Extent in Old Ferry Road Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	*0.0*	*0.0*	*0.0*
Tub Mountain South	40.5	12.5	0.0	5.6	6.9
Willow Creek	34.6	6.7	0.0	0.0	6.7

Table Note: [1]Mileages do not equal total miles due to impacts only being analyzed in the trail-specific study areas

Table 3-536. Old Ferry Road Study Trail Inventory Data for Segment 4—Brogan			
Alternative Route	**Total Miles of Study Alignments in the Old Ferry Road Trail Study Area**	**Total Miles of Study Alignments with Views of the B2H Project Components**	**Total Number of Study Alignment Crossings**
Applicant's Proposed Action	0.0	0.0	0
Variation S4-A1	*0.0*	*0.0*	*0*
Variation S4-A2	*0.0*	*0.0*	*0*
Variation S4-A3	*0.0*	*0.0*	*0*
Tub Mountain South	7.4	5.2	0
Willow Creek	3.2	2.0	0

Table 3-537. Old Ferry Road Study Trail Project Visibility from Viewing Locations for Segment 4—Brogan					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	40.1	0.0	0.0	0.0	0.0
Variation S4-A1	*5.9*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*6.0*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*6.1*	*0.0*	0.0	*0.0*	0.0
Tub Mountain South	40.5	0.0	0.0	12.4	10.4
Willow Creek	34.6	0.0	0.0	6.6	2.6

Applicant's Proposed Action Alternative

The Applicant's Proposed Action Alternative is not located in proximity to the Olds Ferry Road Study Trail.

Variations S4-A1 through S4-A3

These variations are not located in proximity to the Olds Ferry Road Study Trail.

Tub Mountain South Alternative

Trail Management

Under the Tub Mountain South Alternative, the addition of the B2H Project (Link 4-75) including transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT in proximity to Farewell Bend. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and using overland construction techniques where possible, the effects on potential designation would be minimized to the extent practicable.

Scenic and Recreation Resources

Under the Tub Mountain South Alternative, the addition of the B2H Project would modify the trail setting west of the Snake River in an area influenced by an existing 138-kV transmission line, I-84, and

development in and around Farewell Bend. In context with the existing modifications, the B2H Project would attract attention but would be codominant with these existing features resulting in a moderate level of impacts. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and using overland construction techniques, these effects would be reduced to extent practicable.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The B2H Project would modify the arid grassland and shrubland vegetation west of Farewell Bend, through the introduction of geometric forms resulting from right-of-way vegetation clearing, but due to the extent of existing modifications, these effects would be low in magnitude as related to the Olds Ferry Road Study Trail.

Willow Creek Alternative

Trail Management

Under the Willow Creek Alternative, the addition of the B2H Project (Link 4-40) including transmission line structures, construction access roads, and right-of-way vegetation clearing would not affect the potential designation of the trail as an NHT as the B2H Project would be located more than 3 miles away beyond I-84, an existing 138-kV transmission line, and development in and around Farewell Bend.

Scenic and Recreation Resources

Under the Willow Creek Alternative, the addition of the B2H Project would not be subordinate in the trail setting as the B2H Project would be located more than 3 miles away and the area adjacent to the Study Trail has been influenced by an existing 138-kV transmission line, I-84, and development in and around Farewell Bend.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The B2H Project would modify the arid grassland and shrubland vegetation west of Farewell Bend, through the introduction of geometric forms resulting from right-of-way vegetation clearing, but due to the extent of existing modifications and separation from the lands adjacent to the trail, these effects would be low in magnitude as related to the Olds Ferry Road Study Trail.

Conclusions

The Applicant’s Proposed Action Alternative and Willow Creek Alternative would minimally affect the Olds Ferry Road Study Trail. The Tub Mountain South Alternative would moderately affect the study trail west of Farewell Bend and through the application of selective mitigation measures, the effects on the potential designation of the trail would be minimized to the extent practicable.

MEEK CUTOFF STUDY TRAIL

Segment 5—Malheur

This section presents the estimated effects of the B2H Project on the Meek Cutoff Study Trail by alternative route and route variation. Three tables provide quantification and summary of effects on trail resources associated with each alternative and route variation.

- Table 3-538 identifies each alternative and route variation in the trail-specific study corridor and the estimated level of residual effects (i.e., high, moderate, and low) on the Meek Cutoff Study Trail.
- Table 3-539 provides information relevant to trail management and presents the (1) miles of the Meek Cutoff Study Trail alignment located in the study corridor, (2) total miles of the Meek Cutoff Study Trail alignment with views of the B2H Project, and (3) total number of crossings of the Meek Cutoff Study Trail alignment for each alternative and route variation.
- Table 3-540 presents the information on visibility of the B2H Project, associated with each alternative and route variation, as viewed from trail-associated viewing locations within the foreground and middleground distance zones.

Refer to map MV-26 for residual effect levels along B2H alternatives and route variations in context with trail inventory data.

Table 3-538. Meek Cutoff Study Trail Summary of Residual Impacts for Segment 5—Malheur

Alternative Route	Total Length (miles)	Extent in Meek Cutoff Trail Study Area (miles crossed)	Residual Impacts (miles crossed)[1]		
			High	Moderate	Low
Applicant's Proposed Action	40.4	17.1	5.4	2.9	8.8
Variation S5-A1	*7.4*	*5.5*	*0.0*	*0.0*	*5.5*
Variation S5-A2	*7.4*	*3.1*	*0.0*	*0.0*	*3.1*
Variation S5-B1	*2.5*	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B2	*2.8*	*0.0*	*0.0*	*0.0*	*0.0*
Malheur S	43.5	15.3	5.6	2.9	6.8
Malheur A	43.1	15.3	5.6	2.9	6.8

Note: [1]Mileages do not equal total miles due to impacts only being analyzed in the trail-specific study areas

Table 3-539. Meek Cutoff Study Trail Inventory Data for Segment 5—Malheur			
Alternative Route	**Total Miles of Study Alignments in the Meek Cutoff Trail Study Area[1]**	**Total Miles of Study Alignments with Views of the B2H Project Components[1]**	**Total Number of Study Alignment Crossings**
Applicant's Proposed Action	42.6	36.8	4[2]
Variation S5-A1	*16.6*	*2.7*	*0*
Variation S5-A2	*16.6*	*0.9*	*0*
Variation S5-B1	*0.0*	*0.0*	*0*
Variation S5-B2	*0.0*	*0.0*	*0*
Malheur S	39.5	35.0	4[2]
Malheur A	39.5	35.0	4[2]

Table Notes:

[1]The total miles include both alignments of the trail under study by the NPS

[2]Two of these trail crossing occur in proximity to each other, not visible on MV-26, with one crossing of each of the two different trail alignments under study by the NPS.

Table 3-540. Meek Cutoff Study Trail Project Visibility from Viewing Locations for Segment 5—Malheur					
Alternative Route	**Total Length (miles)**	**Extent in Viewer Foreground (0.0 to 0.5 mile) Distance Zone**		**Extent in Viewer Middleground (0.5 to 5.0 miles) Distance Zone**	
		Miles of the B2H Project	**Potential Miles of the B2H Project Visible**	**Miles of the B2H Project**	**Potential Miles of the B2H Project Visible**
Applicant's Proposed Action	40.4	2.9	2.9	14.0	8.3
Variation S5-A1	*7.4*	*0.0*	*0.0*	*5.4*	*2.4*
Variation S5-A2	*7.4*	*0.0*	*0.0*	*3.1*	*0.2*
Variation S5-B1	2.5	0.0	*0.0*	0.0	*0.0*
Variation S5-B2	2.8	0.0	*0.0*	0.0	*0.0*
Malheur S	43.5	3.1	3.1	12.1	6.5
Malheur A	43.1	3.1	3.1	12.1	6.5

Applicant's Proposed Action Alternative

Trail Management

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project (Link 5-5) including transmission line structures, construction access roads, and right-of-way vegetation clearing could affect the potential designation of the trail as an NHT for the portion between the communities of Vale and Harper. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, the effects on potential designation would be minimized to the extent practicable but these high impacts would remain where the Meek Cutoff Study Trail is crossed. Additional mitigation, including compensatory mitigation, would be required to offset these effects (refer to Appendix C).

Scenic and Recreation Resources

Under the Applicant's Proposed Action Alternative, the addition of the B2H Project would modify the trail setting in Malheur Canyon and along Vines Hill to the south through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing in an area with limited cultural modifications resulting in high impacts. Due to the relative scale of the B2H Project, when compared to the existing canal, railroad line, and roads in the area, the B2H Project would dominate views and be incongruent with the existing landscape setting. Through the application of selective mitigation measures, including minimizing cut and fill slopes associated with construction access and work areas, limiting the construction of new or improved access roads, and maximizing the transmission line span across the trail, these effects would be reduced but still remain at a high level.

Historic and Cultural Resources

No identifiable impacts on specific trail-associated historic and cultural resources identified.

Biological, Natural, and Other Resources

The Applicant's Proposed Action Alternative crosses riparian vegetation along the Malheur River but through the application of selective mitigation measures to span the river, these impacts would be low in magnitude as riparian vegetation would not be removed. The B2H Project would modify the arid grassland and shrubland landscapes adjacent to the Malheur River through the introduction of geometric forms resulting from right-of-way vegetation clearing. To reduce effects on these vegetation communities, selective mitigation measures would be applied to minimize vegetation clearing to the extent practicable.

Variations S5-A1 and S5-A2

Since these two variations are located more than two miles away from trail resources, in an area where views from the trail would be partially to fully screened by terrain, low impacts on the Meek Cutoff Study Trail were identified for both Variations S5-A1 and S5-A2.

Variations S5-B1 and Variation S5-B2

These variations are not located in proximity to the Meek Cutoff Study Trail.

Malheur S Alternative

This alternative would have similar impacts on the Meek Cutoff Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment (Link 5-5) across the study trail routes and where the alternatives diverge (Link 5-25), they are located in a similar landscape setting crossing the same ridge south of the trail.

Malheur A Alternative

This alternative would have similar impacts on the Meek Cutoff Study Trail as the Applicant's Proposed Action Alternative since the two alternatives share the same alignment (Link 5-5) across the study trail routes and where the alternatives diverge (Link 5-25), they are located in a similar landscape setting crossing the same ridge south of the trail.

Conclusions

All alternative routes share a common alignment in proximity to the Meek Cutoff Study Trail. Due to the limited existing modifications in proximity to the B2H Project crossing of the study trail, the B2H Project would highly affect views from the study trail and, as such, would require compensatory mitigation to reduce effects on the trail's potential designation. The Applicant's Proposed, Malheur A, and Malheur S alternatives diverge south of the southern trail crossing but continue to cross similar terrain until views are screened by topography.

3.2.16 AIR QUALITY AND CLIMATE CHANGE

This section describes the existing air quality environment that could be affected by the B2H Project and discusses predicted emissions of air pollutants and effects on air quality and climate change from implementing the B2H Project. The regulatory framework, scoping issues, method, and affected environment are presented followed by a discussion of the environmental impacts.

3.2.16.1 REGULATORY FRAMEWORK

FEDERAL

Clean Air Act

The EPA (2015) summarizes the history of the Clean Air Act of 1970 as follows:

> The legal authority for federal programs regarding air pollution control is based on the 1990 Clean Air Act Amendments (1990 CAAA). These are the latest in a series of amendments made to the Clean Air Act (CAA). This legislation modified and extended the federal legal authority provided by the earlier Clean Air Acts of 1963, 1970, and 1977.
>
> The 1990 CAAA substantially increased the authority and responsibility of the federal government. New regulatory programs were authorized for the issuance of stationary source operating permits. The NESHAPs [National Emission Standards for Hazardous Air Pollutants] were incorporated into a greatly expanded program for controlling toxic air pollutants. The provisions for attainment and maintenance of NAAQS were substantially modified and expanded.

The EPA adopted ambient air quality standards in a series of rule makings that are codified in 40 CFR Part 50. The current National Ambient Air Quality Standards (NAAQS) for listed air pollutants are shown in Table 3-541.

Areas in which the NAAQS are being met are called attainment areas, while areas where the standards are not currently being met are called nonattainment areas. Separate procedures have been established for federal review of projects in attainment areas versus nonattainment areas. The study corridor for the B2H Project does not traverse any identified nonattainment areas in either Oregon or Idaho (refer to Map 3-9).

The EPA also has adopted standards to prevent the significant deterioration of air quality in attainment areas like the B2H Project area. Those regulations address stationary sources for air pollutants. None of the B2H Project construction facilities or activities is considered stationary sources, and none of the operational facilities are large enough to trigger Prevention of Significant Deterioration (PSD) or New Source Review (NSR) program requirements.

Table 3-541. National Ambient Air Quality Standards

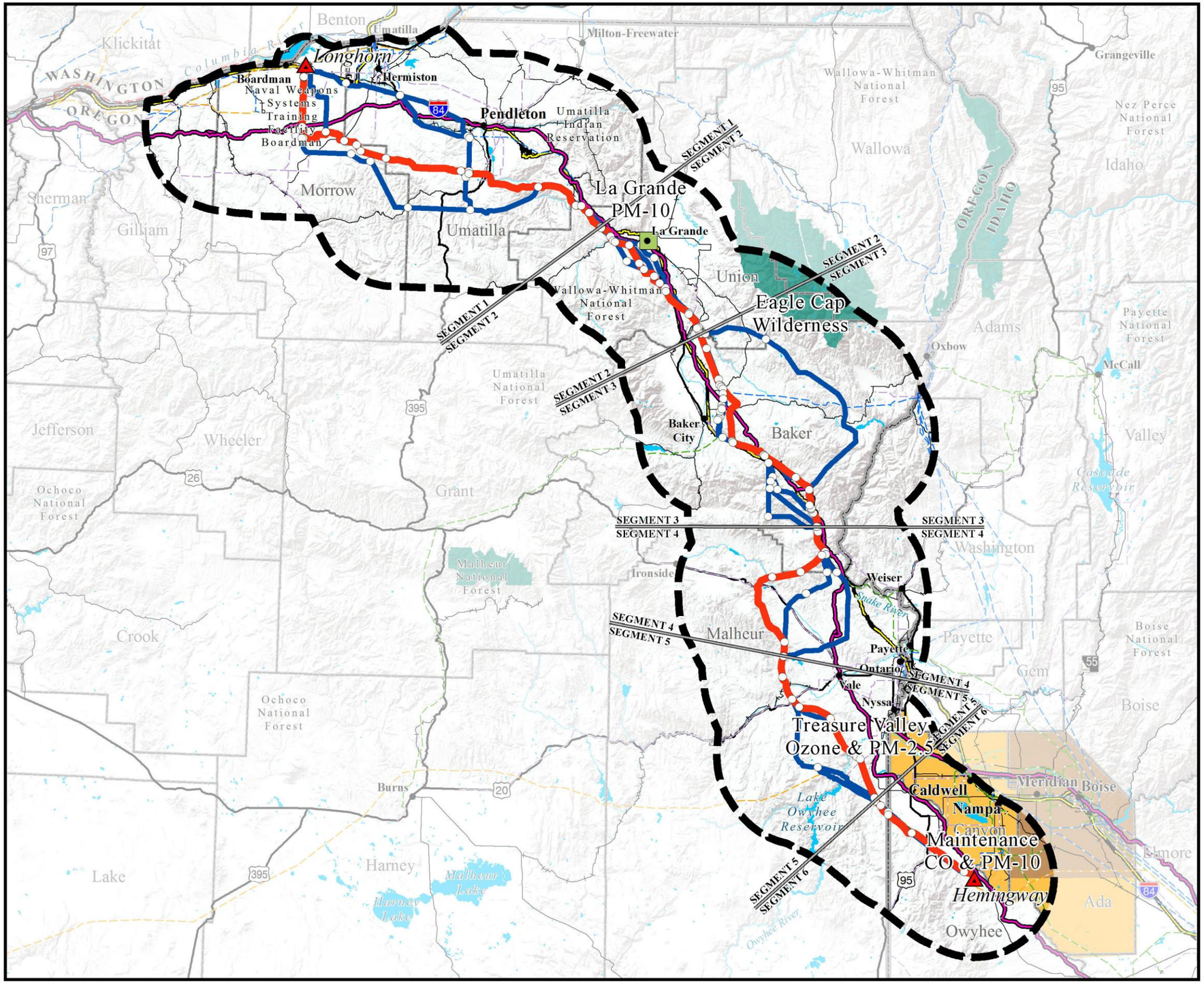
Criteria Pollutant	Averaging Time	National Standards Concentration
O_3	1 hour	No current standard
O_3	8 hours	0.075 parts per million, (147 micrograms per cubic meter of air) (3-year average of annual fourth-highest daily maximum)
CO	8 hours	9 parts per million (10,000 micrograms per cubic meter of air)
CO	1 hour	35 parts per million (40,000 micrograms per cubic meter of air)
NO_2	Annual average	0.053 parts per million (100 micrograms per cubic meter of air)
NO_2	1 hour	No current standard
SO_2	Annual average	No current standard
SO_2	24 hours	0.14 parts per million (365 micrograms per cubic meter of air)
SO_2	3 hours	0.5 parts per million (1,300 micrograms per cubic meter of air)
SO_2	1 hour	No current standard
PM_{10}	24 hours	150 micrograms per cubic meter of air
PM_{10}	Annual arithmetic mean	No current standard
$PM_{2.5}$	24 hours	35 micrograms per cubic meter of air (3-year average of 98^{th} percentile)
$PM_{2.5}$	Annual arithmetic mean	15 micrograms per cubic meter of air (3-year average)
Lead	Calendar quarter	0.15 micrograms per cubic meter of air

Table Source: 40 CFR Part 50.

Table Notes:
O_3 = ozone
CO = carbon monoxide
NO_2 = nitrogen dioxide
SO_2 = sulfur dioxide
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)

Map 3-9 identifies areas with air quality designations near the B2H Project. These include federal Class 1 areas (designated wilderness areas), nonattainment and maintenance areas in Idaho and Oregon, and federal Class 1 areas and areas of concern established by federal land agencies.

In addition to the PSD and NSR regulatory programs, the EPA administers other air quality regulatory programs. Table 3-542 summarizes the EPA regulatory programs that do and do not apply to the B2H Project.



Map 3-9

Air Quality Features

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Air Quality

- Federal Class 1 Area
- Nonattainment Area
- Area of Concern
- Maintenance Area

Project Features

- Project Area Boundary
- Link Node
- Substation (Project Terminal)
- Segment Line
- Applicant's Proposed Action Alternative
- Alternative Route

General Reference

- City or Town
- Interstate Highway
- 500-kV Transmission Line
- U.S. Highway
- 345-kV Transmission Line
- State Highway
- 230-kV Transmission Line
- Lake or Reservoir
- 138-kV Transmission Line
- State Boundary
- 69- to 115-kV Transmission Line
- County Boundary
- Railroad
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Class I Airsheds, NPS 2014; Air Quality Planning Areas, IDEQ 2010;
La Grande PM-10 Maintenance Area, LSD 2014; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 5 10 20 30 40
Miles
1:1,393,920 or 1 inch = 22 miles

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Table 3-542. Summary of Regulatory Program Applicability		
Applicable General Regulatory Programs	**Oregon**	**Idaho**
New Source Performance Standards	No	No
Prevention of Significant Deterioration	No	No
New Source Performance Standards[1]	Possibly	Possibly
Title III—National Emissions Standards for Hazardous Pollutants	No	No
Title IV—Acid Rain	No	No
Title V—Part 70 Operating Permits[1]	Possibly	Possibly
General permit requirements[2]	Yes	Yes
Dispersion modeling[3]	Possibly	Possibly
Impact analysis	No	No
Fugitive-dust mitigation guidelines	Yes	Yes

Table Notes:

[1]New Source Performance Standards and the application of Title V may be invoked by the siting and use of communication-site standby generator engines. Program applicability would be determined through consultation with the state air agencies.

[2]Permits may be required for portable concrete batch plants.

[3]If Title V—Part 70 Operating Permits or other permits are needed, air dispersion modeling may be required.

New Source Performance Standards

No New Source Performance Standards applicable to construction activities on transmission lines and substations (construction or expansion) exist. However, the Applicant would consult with the state air quality agencies to determine whether any New Source Performance Standards apply to the communication- site standby generator engines.

Title V Operating Permits

Currently, no Title V regulations applicable to construction activities on transmission line and substation construction or expansion exist. However, the Applicant would consult with the state air quality agencies to determine whether Title V is applicable to the communication-site standby generator engines and potential pollutant loads associated with permanent or temporary generators.

Conformity with State Implementation Plan

Neither the proposed B2H Project nor any of the alternatives are located in any known federally designated nonattainment areas; therefore, a conformity determination is not required.

U.S. Forest Service Land and Resource Management Plan

The proposed B2H Project would cross approximately 6 miles of the Wallowa-Whitman National Forest. The Wallowa-Whitman *Land and Resource Management Plan* (USFS 1990) contains standards for the management of various resources. Prescribed burning standards may apply to the B2H Project if open burning of vegetation cleared from the right-of-way takes place. There is currently no firm estimate of the number of acres that would require clearing and subsequent burning. Cleared materials would likely be a combination of unspecified forestry wastes and rangeland brush and grasses. The standards

require that, where appropriate, the following prescribed burning techniques be used to minimize smoke emissions and to meet emission objectives:

- Avoid burning when air stagnation advisories are in effect, during pollution episodes, or when temperature inversions exist.
- Design burning activities to use climatic conditions that favor rapid smoke dispersion.
- Burn under favorable moisture conditions, using guides developed by the Pacific Wildland Fire Sciences Laboratory.
- Accomplish mop-up quickly to reduce residual smoke.
- Design ignition method and firing technique to aid dispersion.
- Use smoke models to predict impacts, including plume trajectory.
- Use rake-type dozer blades to keep soil out of piles and windrows.
- Keep fire from spreading into decks of cull logs.

Bureau of Land Management Resource Management Plans

Portions of the proposed B2H Project and alternatives are located in two BLM RMP areas for which the applicable RMPs identify specific air quality management objectives.

Southeastern Oregon Resource Management Plan

The Southeastern Oregon RMP identifies the following air quality objective: “Meet or exceed NAAQS and PSD regulations with all authorized actions” (BLM 2002). The RMP provides the following management actions to achieve the plan objective:

> Prior to the actual ignition of any prescribed fire, an approved prescribed fire burn plan would be in place and adhered to throughout the B2H Project. The burn plan would include information and techniques used to reduce or alter smoke emission levels. Information (including resource objectives, acres to be burned, fuel types, fuel moisture, fuel loading, fuel continuity, topography, location of population centers and Class 1 air sheds) assists fire managers in determining what weather conditions, firing methods, and mop-up standards should be used to minimize impacts. All prescribed fire projects would be completed in accordance with the “Oregon Smoke Management Plan.” The majority of fuel types in the planning area do not allow opportunities to reduce emissions; therefore, emissions will be managed by timing and atmospheric dispersal.

Baker Resource Management Plan

The Baker RMP includes the following management actions:

> Under the 1977 Clean Air Act Amendment, BLM-administered lands were given Class II air classification, which allows moderate deterioration associated with moderate population and industrial growth. The BLM will manage public lands as Class II unless they are reclassified. Coordinate soil, water, and air concerns and activities with other resources in all phases of management actions, from the planning stage to final

monitoring of the results. Review all proposed resource projects and surface disturbing activities to ensure that soils and watersheds are protected, rehabilitated, or improved.

Owyhee Resource Management Plan

The Southeastern Oregon RMP identifies the following air quality objective: "Meet or maintain the NAAQS and the PSD regulations with all authorized actions" (BLM 1999). The management actions and allocations identified to meet the objective include the following:

Limit prescribed burning in juniper/sagebrush/grassland areas to a maximum of 15,000 acres per year (or the equivalent of 100,000 tons of fuels) and average 7,500 acres of prescribed burns per year over the life of the plan. Projected emissions from individual burns will be calculated to ensure compliance with NAAQS and PSD regulations.

Limit unnecessary emissions from existing and new point and nonpoint sources by requiring and implementing standard operating procedures and stipulations for reducing or controlling emissions.

STATE OF OREGON

Oregon air emissions are regulated by the ODEQ pursuant to the Oregon Revised Statutes, Chapter 468A, and the OARs, Divisions 200–268. Prescribed burning on forestland in Oregon would be conducted in compliance with the Oregon Smoke Management Rules (OAR 629-048-0001 through 629-048-0500).

STATE OF IDAHO

Idaho air emissions are regulated by the Idaho Department of Environmental Quality, Air Quality Division. Chapter 58.01.01 of the Idaho Administrative Procedures Act presents the applicable regulations for criteria pollutants and fugitive-dust control.

Idaho and Oregon have established ambient air quality standards for their respective states. Table 3-543 presents Idaho's and Oregon's criteria-pollutant standards for protecting human health (primary standards) and public welfare (secondary standards).

Table 3-543. Oregon and Idaho State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Idaho Standards Concentration	Oregon Standards Concentration
O_3	1 hour	Not applicable	Not applicable
O_3	8 hours	0.075 part per million (147 micrograms per cubic meter) (3-year average of annual fourth-highest daily maximum)	0.075 part per million (147 micrograms per cubic meter) (3-year average of annual fourth-highest daily maximum)
CO	8 hours	9 parts per million	9 parts per million (10,000 micrograms per cubic meter)
CO	1 hour	35 parts per million	35 parts per million (40,000 micrograms per cubic meter)

Table 3-543. Oregon and Idaho State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Idaho Standards Concentration	Oregon Standards Concentration
NO_2	Annual average	0.053 part per million	0.053 part per million (100 micrograms per cubic meter)
NO_2	1 hour	100 part per billion	Not applicable
SO_2	Annual average	80 micrograms per cubic meter	0.02 part per million as an annual arithmetic mean for any calendar year at any site (80 micrograms per cubic meter)
SO_2	24 hours	365 micrograms per cubic meter	0.10 part per million as a 24-hour average concentration more than once per calendar year at any site (365 micrograms per cubic meter)
SO_2	3 hours	0.5 part per million	0.5 part per million as a three-hour average concentration more than once per year at any site
SO_2	1 hour	75 part per billion	Not applicable
PM_{10}	24 hours	150 micrograms per cubic meter	150 micrograms per cubic meter
PM_{10}	Annual arithmetic mean	Not applicable	Not applicable
$PM_{2.5}$	24 hours	35 micrograms per cubic meter (3-year average of 98th percentile)	35 micrograms per cubic meter (3-year average of 98th percentile)
$PM_{2.5}$	Annual arithmetic mean	15 micrograms per cubic meter (3-year average)	15 micrograms per cubic meter (3-year average)
Lead	Calendar Quarter	0.15 micrograms per cubic meter	0.15 micrograms per cubic meter as a maximum arithmetic mean averaged over a calendar quarter
Particle Fallout	1 Month	Not applicable	10 grams per square meter in an industrial area 5.0 grams per square meter in an industrial area if visual observations show a presence of wood waste or soot and the volatile fraction of the sample exceeds 70 percent 5.0 grams per square meter in residential and commercial areas 3.5 grams per square meter in residential and commercial areas if visual observations show the presence of wood waste or soot and the volatile fraction of the sample exceeds 70 percent

Table Source: Oregon Revised Statutes, Chapter 468A; Oregon Administrative Rules, Divisions 200–268; Idaho Administrative Procedures Act, Chapter 58.01.01.

Table Notes:
CO = carbon monoxide
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_2 = sulfur dioxide

PERMITTING REQUIREMENTS (CONSTRUCTION AND OPERATIONS)

State of Oregon

Pursuant to OAR 340-216-0056, portable concrete batch plants, used during the construction phase, would be required to obtain stationary-source location and operations permits. Concrete batch plants are generally classified as "minor sources" under OAR 340-216-0020. In addition, the Applicant would consult with the ODEQ regarding the need for operations permits for the small communication-site standby generator engines.

State of Idaho

Sections 220 through 222 of Chapter 58.01.01 of the Idaho Administrative Procedures Act provide for permit exemptions. According to Section 220, "fugitive emissions shall not be considered in determining whether a source meets the applicable exemption criteria unless required by federal law." The proposed portable concrete batch plants would likely meet the requirements for permit exemption, given that fugitive emissions would be the predominant emissions from such plants. In addition, the Applicant would consult with the Idaho Department of Environmental Quality regarding the need for operational permits for the small communication-site standby generator engines.

FUGITIVE-DUST CONTROL

Sources, including construction projects, operating within Oregon and Idaho are required to control fugitive dust (i.e., airborne particulate matter). The following are fugitive-dust regulations and control measures that apply to the B2H Project.

State of Oregon

OAR Sections 340-200 through 340-268 do not provide specific rules for fugitive-dust control. Section 340-200-0020 defines *fugitive emissions* as follows:

> (a) Except as used in subsection (b) of this section, [fugitive emissions] means emissions of any air contaminant which escape to the atmosphere from any point or area that is not identifiable as a stack, vent, duct, or equivalent opening
>
> (b) As used to define a major Oregon Title V Operating Permit program source, [fugitive emissions] means those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

State of Idaho

The Idaho Administrative Procedures Act contains specifics regulations for controlling fugitive dust and preventing particulate matter emissions, as excerpted below (Section 58.01.01, Rules 650 and 651):

> **650. RULES FOR CONTROL OF FUGITIVE DUST.**
>
> The purpose of Sections 650 through 651 is to require that all reasonable precautions be taken to prevent the generation of fugitive dust. (5-1-94)

651. GENERAL RULES.

All reasonable precautions shall be taken to prevent particulate matter from becoming airborne. In determining what is reasonable, consideration will be given to factors such as the proximity of dust emitting operations to human habitations and/or activities, the proximity to mandatory Class I Federal Areas and atmospheric conditions which might affect the movement of particulate matter. Some of the reasonable precautions may include, but are not limited to, the following: (3-30-07)

01. Use of Water or Chemicals. Use, where practical, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land. (5-1-94)

02. Application of Dust Suppressants. Application, where practical, of asphalt, oil, water or suitable chemicals to, or covering of dirt roads, material stockpiles, and other surfaces which can create dust. (5-1-94)

03. Use of Control Equipment. Installation and use, where practical, of hoods, fans and fabric filters or equivalent systems to enclose and vent the handling of dusty materials. Adequate containment methods should be employed during sandblasting or other operations. (5-1-94)

04. Covering of Trucks. Covering, when practical, open bodied trucks transporting materials likely to give rise to airborne dusts. (5-1-94)

05. Paving. Paving of roadways and their maintenance in a clean condition, where practical. (5-1-94)

06. Removal of Materials. Prompt removal of earth or other stored material from streets, where practical. (5-1-94)

OUTDOOR BURNING

ODEQ regulations prohibit certain types of burning in selected areas of the state. Outside the Willamette Valley, in cities with populations larger than 4,000 people, Oregon's air quality rules prohibit open burning of commercial, construction, demolition, and land clearing debris within 3 miles of the city limits. Under rare circumstances, when no other means of disposal are available or when other means are severely restricted, ODEQ may issue a permit, known as an Open Burning Letter Permit, to allow the burning of these kinds of waste in the restricted areas. The Applicant would consult with the state air quality agencies to determine whether an Open Burning Letter Permit would be required for the B2H Project.

STATE CLEAN AIR PLANS

The B2H Project and alternatives do not traverse any nonattainment or air quality maintenance areas in either state. Therefore, no state clean air plans would apply.

3.2.16.2 Issues Identified for Analysis

The following list summarizes air quality issues that were raised during scoping, as well as issues that must be considered as stipulated by laws or regulations. For a complete list of scoping issues, refer to the B2H Project *Revised Scoping Report* (BLM 2011a).

- Will the B2H Project be inconsistent with county, state, and federal air quality plans?
- Will emissions of air pollutants exceed what is allowable by state and federal law?
- Will the B2H Project cause any adverse impacts on air quality in wilderness areas?
- How much dust will be generated by construction activities? How will it be managed?

3.2.16.3 Mitigation Planning and Effectiveness

In addition to compliance with all applicable federal, state, and local air quality regulations, Table 2-7 includes design features of the B2H Project for environmental protection and construction and operation standards to reduce effects on air quality and climate that would be conditions of any B2H Project authorizations.

In the absence of more refined analysis, Tier 3 or better diesel equipment is required to provide a reasonable assurance that 1-hour NO_2 impacts will not exceed that National Ambient Air Quality Standard. Beyond this requirement, no additional mitigation of effects on air quality or climate change are proposed beyond compliance with all applicable federal, state, and local air quality.

3.2.16.4 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project on air quality.

The methods used to estimate emissions from the construction and operation phases of the B2H Project represent accepted techniques for deriving emissions estimates from construction and operational activities. Emission Factors 2007 (EMFAC 2007), Version 2.30 (California Air Resources Board 2006), was used to generate a set of composite factors for the statewide area of California. It was assumed that the overall vehicle mix in California is similar to the vehicle mix in Oregon and Idaho. The EMFAC run was generated for a vehicle mix from 1969 to 2013. The composite factors generated were then applied to worker travel data from 2013 to 2015.

The analysis considered the following:

- Construction disturbance areas estimated for the B2H Project (e.g., access road construction and use during the construction phase, tower construction areas, and substation construction areas)
- Construction equipment exhaust emissions
- Use of portable concrete batch plants during the construction phase

- Vehicle exhaust emissions associated with construction worker travel and construction supply delivery along the routes
- Use of unpaved access and service roads during the operations phase
- Vehicle emissions used for inspection and maintenance during the operations phase
- Minor stationary-source emissions applicable to operations activities

The study corridor for air quality encompasses the geographic areas defined by applicable state air quality plans, federal conformity thresholds, and local requirements within the geographic area of the B2H Project. The study corridor used for quantifying emission impacts includes the construction corridor and substation sites along with emissions sources such vehicles traveling on public roads and construction-site access roads and helicopters used during construction.

The majority of the emissions related to the B2H Project would occur in the right-of-way during construction and at the substation sites. Most impacts from B2H Project-related emissions would likely be confined to the proximity of the construction corridor or substation/communication-site property lines.

It is beyond the scope of existing science to relate a specific source of greenhouse gas emission with the creation (or mitigation) of any specific climate-related environmental effects. Further, since the specific effects of a particular action, which may contribute to or mitigate against climate change, cannot be determined, it also is not possible to determine whether any of these particular actions will lead to significant climate-related environmental effects. Finally, there are still no regulatory standards for climate change. Thus, the analysis in the EIS represents the best available science, as suggested in the Council on Environmental Quality's revised draft guidance on consideration of greenhouse gas emissions and the effects of climate change.

3.2.16.5 Affected Environment

Air Quality

A review of published annual air quality monitoring reports indicates that existing air quality in each state is generally good to excellent. In Oregon, the closest Class I area to the B2H Project is the Eagle Cap area, which lies approximately 25 miles northeast of the Applicant's Proposed Action Alternative in Wallowa County. In Idaho, the closest Class I area to the B2H Project is the Sawtooth area, which lies more than 55 miles to the east. Because Class I areas are distant from the B2H Project area, no adverse air quality effects on Class I areas are anticipated as a result of B2H Project construction or operation.

Map 3-9 shows the current locations of the Idaho and Oregon nonattainment areas for particulate matter less than 10 microns (PM_{10}), as well as other areas of air quality concern. Idaho is in attainment, with the exception of two PM_{10} nonattainment areas in the southeast corner of the state and the north Ada County carbon monoxide and PM_{10} maintenance area. Oregon has a small PM_{10} nonattainment area in the La Grande area.

Preliminary inventories of emissions from greenhouse gases (GHGs)—primarily carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—have been

prepared for each state through a cooperative effort with the Center for Climate Strategies, ODEQ, or both. These inventories do not include reporting from all identified sectors and, therefore, most likely do not represent a complete analysis of GHG emissions for each state. Table 3-544 presents the total GHG emissions for Idaho and Oregon from 2000 to 2011. The total emissions are presented in million metric tons of carbon dioxide (CO_2) equivalent.

Table 3-544. Total Greenhouse Gas Emissions by State

State	Year	Total Greenhouse Gas Emissions (million metric tons of carbon dioxide equivalent)
Idaho	2000	26.4
Idaho	2001	26.7
Idaho	2002	26.2
Idaho	2003	25.8
Idaho	2004	27.0
Idaho	2005	27.6
Idaho	2006	28.4
Idaho	2007	28.7
Idaho	2008	27.7
Idaho	2009	27.0
Idaho	2010	27.9
Idaho	2011	27.8
Oregon	2000	60.8
Oregon	2001	59.8
Oregon	2002	58.6
Oregon	2003	59.2
Oregon	2004	60.5
Oregon	2005	60.8
Oregon	2006	60.2
Oregon	2007	57.0
Oregon	2008	55.5
Oregon	2009	53.3
Oregon	2010	52.9
Oregon	2011	49.2

Table Source: World Resources Institute 2014

CLIMATE

State of Oregon

Oregon has a mild, though varied, climate; violent weather events are rare but are severe enough to cause serious widespread damage. Oregon is divided into six major agroclimatic areas, with the B2H Project lying predominantly in the Columbia and Snake River Basins. The climate in these basins is best characterized as a continental climate. The climate has maritime influences in winter, particularly west of the Blue Mountains and monsoonal influences in the summer, particularly south of the Blue Mountains and the western Snake River Plain. In the Columbia River Basin and the Blue Mountains,

annual precipitation totals are about 15 to 20 inches; however, some of the mountain regions receive as much as 35 inches per year (Western Regional Climate Center n.d.a).

State of Idaho

Sizable areas in the Boise River Basin receive an average of 40 to 50 inches of precipitation per year, with a few points or small areas receiving more than 60 inches. Large areas, including the northeastern valleys, much of the upper Snake River Plain, Central Plains, and the lower elevations of the southwestern valleys receive less than 10 inches annually. The major mountain ranges of the state accumulate a deep snow cover during winter months, and the release of water from the melting snowpack in late spring furnishes irrigation water for more than 2 million acres, mainly within the Snake River Basin above Weiser, Idaho (Western Regional Climate Center n.d.b).

CLIMATE CHANGE

Ongoing scientific research has identified the potential impacts on global climate of anthropogenic (human-made) GHG emissions and changes in biological carbon sequestration (natural storage of carbon in soils, plants, and marine life) due to land management activities. Several activities contribute to climate change, including emissions of GHGs (especially CO_2 and methane) from fossil fuel development, activities using combustion engines, changes to the natural carbon cycle, and changes in albedo (amount of solar energy reflected by the earth's surface).

In 2001, the Intergovernmental Panel on Climate Change estimated that by the year 2100, global average surface temperatures would increase by 2.5 to 10.4 degrees Fahrenheit above 1990 levels. The National Academy of Sciences has confirmed these findings but also has indicated uncertainties regarding how climate change may affect different regions. Computerized models predict that increases in temperature would not be distributed equally but would likely be accentuated at higher latitudes. Warming during the winter is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures. While increases in temperatures would increase water vapor in the atmosphere and enhance heavy storm events, they also would reduce soil moisture and increase generalized drought conditions. Although large-scale spatial shifts in precipitation distribution may occur, these changes are more uncertain and difficult to predict (Intergovernmental Panel on Climate Change 2001; National Academy of Sciences 2001; U.S. Global Change Research Program 2009).

Forests, woodlands, and rangelands store carbon, which affects atmospheric concentrations of CO_2 and thereby affects global climate. Vegetation management can provide either a source of CO_2 or a sink of CO_2 through vegetation growth. In the U.S., forests have acted as a carbon sink throughout the last century (Birdsey et al. 2006). Forests and harvested wood in the U.S. currently represent a carbon pool of 43.9 billion metric tons (EPA 2007). In addition, forest management currently represents an annual accumulation of 191 million metric tons of carbon, which represents an offset of approximately 11 percent of total carbon emissions in the U.S. (EPA 2007). Globally, the combination of vegetation, soil, and detritus currently store 2.3 trillion metric tons of carbon (Denman et al. 2007:515). Furthermore,

atmospheric carbon in the form of CO_2 is increasing at a rate of 3.2 to 4.1 billion metric tons of carbon per year (Denman et al. 2007:512).

Because there is incomplete and unavailable information on both the current inventory of carbon storage and the effect of management on carbon storage (as described below), it is not possible to describe the total storage of carbon in forests, rangelands, and wood harvested from the Decision Area with precision and accuracy (BLM 2011b:3-5).

Current scientific assessments of future climate change are more global and regional in scale. As a result, there are no precise scientific assessments regarding either the impact future climate change or projections for specific localized. Estimating quantitative changes in the local environment is not feasible at this time, although several scientific organizations are working on downscaling models that should be useful in the near future. With this in mind, it is still reasonable to assume that over the next 20 years the region will experience some noticeable changes attributable to factors related to climate change. Changes in stream systems, including their flow, temperature, and turbidity, should be substantial enough to influence irrigation activities, flood control, and water related recreational activities. Spring runoff is expected to come earlier and more quickly with lower stream flows later in the season. Stream temperatures are expected to rise enough to reduce cold-water fisheries habitat. Furthermore, both the timing and length of seasons should be affected. This, in turn, would influence changes in the ranges, phenology, community composition, biotic interactions, and behavior of both plants and animals. Climate change predictions include an increase in duration and frequency of drought conditions and, conversely, increased precipitation events. This combination can result in an increase in soil erosion and stream sedimentation and can alter stream channels (BLM 2011b:3-3; Climate Change Impacts Group 2010; Hegerl et al. 2007).

The 2010 Oregon Climate Assessment Report states the following: “Some model simulations of future vegetation changes in Oregon indicate that high elevation areas of subalpine forest and alpine tundra as well as areas of shrubland in eastern Oregon will contract under projected future climate changes. These projected vegetation changes would reduce critical habitat for species of management concern, such as greater sage-grouse (*Centrocercus urophasianus*)” (Oregon Climate Change Research Institute 2010).

3.2.16.6 Environmental Consequences

This section discusses potential effects of the B2H Project on air quality and climate change. Air quality and climate change effects may be generated from the following activities:

- Construction of access roads
- Construction of the transmission towers and pad sites
- Construction of substations and communication sites
- Activities involved with the ongoing use and maintenance of the transmission line, substations, and right-of-way and decommissioning

Effects of the B2H Project are described project-wide because the intensity and duration of air quality and climate change effects would be substantially the same for all the alternative routes.

NO ACTION ALTERNATIVE

The No Action Alternative would result in the continuation of current air quality conditions and would avoid any effects on climate change through direct effects of GHG emissions or the indirect effects of reductions in carbon storage capacity.

APPLICANT' PROPOSED ACTION ALTERNATIVE

Construction

Air Quality

Construction activities for the proposed B2H Project would take place in the following sequence: geotechnical testing, site preparation/trenching, foundation work, installation of structures and conductors, and right-of-way/site restoration.

The geotechnical investigation will be completed before construction commences on the transmission line or ancillary facilities; therefore, emissions from the geotechnical investigation will not overlap in time or space with emissions from other B2H Project construction activities. Emissions from the geotechnical investigation will include fugitive dust from ground-disturbance activities, tailpipe emissions from traffic, and emissions from nonroad engines associated with drill rigs and other equipment. Emissions from the geotechnical investigation have not been quantified but would be qualitatively similar to those expected from transmission line construction but at a reduced level. In the absence of more refined analysis, Tier 3 or better diesel equipment is required to provide a reasonable assurance that 1-hour NO_2 impacts will not exceed that National Ambient Air Quality Standard. Construction activities that would generate emissions include land clearing, ground excavation, and cut and fill operations. These construction activities would occur 6 days per week for up to 10 to 12 hours per day during the construction period. The intermittent and short-term emissions generated by these activities would include dust from soil disruption and combustion emissions from the construction equipment. Emissions associated with construction equipment include PM_{10}, $PM_{2.5}$ (particulate matter less than 2.5 microns), nitrogen oxides, carbon monoxide, volatile organic compounds, sulfur oxides, and small amounts of air toxic pollutants. These emissions could result in low, short-term impacts on air quality in the immediate vicinity of B2H Project construction. Table 3-545 lists the estimated emissions of these criteria pollutants that would be generated by the construction of proposed B2H Project facilities in each county.

Transmission line and construction data supplied by the Applicant indicate that approximately 8 percent of the Applicant's Proposed Action Alternative is located in Idaho, with the remaining 92 percent of the Applicant's Proposed Action Alternative in Oregon. Table 3-546 shows the approximate total anticipated emissions for construction of the B2H Project by state. Table 3-547 presents the construction emissions on a normalized yearly basis. Table 3-548 presents the construction emissions breakdown (from Table 3-547) on a per-mile basis.

Table 3-545. Estimated Emissions of Criteria Pollutants from Construction

Portion of Route and County	Approximate Length (miles)	PM_{10} (tons)[1]	$PM_{2.5}$ (tons)[1]	NO_x (tons)	CO (tons)	SO_x (tons)	VOCs (tons)
Morrow County	45.8	80.8	59.5	70.9	529.6	0.7	74.3
Umatilla County	49.5	87.3	64.4	76.6	572.4	0.8	80.3
Union County	39.4	69.5	51.2	61.0	455.6	0.6	63.9
Baker County	74.4	131.3	96.7	115.1	860.3	1.2	120.7
Malheur County	72.1	127.2	93.7	111.5	833.7	1.2	116.9
Owyhee County	23.8	42.0	30.9	36.8	275.2	0.4	38.6
Total Emissions in Oregon		496.1	365.5	435.1	3,251.6	4.5	456.1
Total Emissions in Idaho		42.0	30.9	36.8	275.2	0.4	38.6
Total B2H Project Emissions[1]		538.1	396.4	471.9	3,526.8	4.9	494.7

Table Notes:
[1]Totals may not match other tables due to mileage multiplication and rounding.
CO = carbon monoxide
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_x = sulfur oxides
VOCs = volatile organic compounds.

Table 3-546. Construction Emissions Breakdown by State

Pollutant	Oregon Emissions (tons per construction period)	Idaho Emissions (tons per construction period)
NO_2	434.7	37.1
CO	3,249.1	277.5
VOCs	455.8	38.9
SO_x	4.5	0.4
PM_{10}	495.8	42.3
$PM_{2.5}$	365.4	31.2
CO_2e	49,376.0	4,294.0

Table Notes: Refer to Appendix B.9 of the Revised Plan of Development for the methods used to quantify the estimated emissions.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_2 = nitrogen dioxide
SO_x = sulfur oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
VOCs = volatile organic compounds

Table 3-547. Annualized Construction Emissions Breakdown by State		
Pollutant	**Oregon Emissions (tons per year)**	**Idaho Emissions (tons per year)**
NO_x	193.2	16.5
CO	1,444.1	123.3
VOCs	202.6	17.3
SO_x	2.0	0.2
PM_{10}	220.4	18.8
$PM_{2.5}$	162.4	13.9
CO_2e	21,945.0	1,908.0

Table Notes: Refer to Appendix B.9 of the Revised Plan of Development for the methods used to quantify the estimated emissions.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
SO_x = sulfur oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
VOCs = volatile organic compounds

Construction equipment would be operated as needed during daylight hours only, and the emissions from gasoline and diesel engines would be minimized by engine compliance with mobile-source exhaust standards established by the EPA. Therefore, emissions from the construction of the transmission line, substations, and communication facilities are not expected to cause or contribute to: a violation of an applicable ambient air quality standard or contribute substantially to an existing or projected air quality violation. Most of the construction equipment would be powered by diesel engines that would meet current EPA emissions standards based on engine size and the date of the manufacture. In addition, B2H Project-related vehicles and construction equipment would be required to use low-sulfur diesel fuel as soon as it is commercially available.

Table 3-548. Construction Emissions per Mile	
Pollutant	**Average Emissions (tons per mile per period)[1]**
NO_x	1.62
CO	11.56
VOCs	1.62
SO_x	0.016
PM_{10}	1.76
$PM_{2.5}$	1.30
CO_2e	174.1

Table Notes:
[1]Assumes route mileage is about 305 miles, with about 281.2 miles in Oregon and about 23.8 miles in Idaho. Refer to Appendix B.9 of the Revised Plan of Development for the methods used to quantify the estimated emissions.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
SO_x = sulfur oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
VOCs = volatile organic compounds

The anticipated construction activities are generally not required to have stationary- or indirect-source permits by either of the affected states and are exempt from the major regulatory programs such as NSR, PSD, NESHAPs, Title IV, and Title V. Construction activities must, however, comply with applicable state requirements for fugitive-dust control. Temporary operations permits also may be required for the portable concrete batch plants.

Fugitive-dust emissions would depend on the moisture content and texture of the soils that would be disturbed. The construction emissions would vary from day to day depending on the level of activity, specific operations, and prevailing weather. Fugitive-dust emissions tend to stay localized and settle to the ground quickly. Fugitive-dust emissions would be short-term and low intensity.

Electrical power needs within the construction corridor would be met through the use of portable electrical generators. These generators are typically diesel powered and would be located at the various construction sites according to need.

Table 3-549 compares annualized construction emissions to the statewide emissions inventory values. The construction emissions are for the emissions in the five counties in Oregon and one county in Idaho. This comparison indicates that construction emissions of criteria pollutants represent small (less than one-half percent) temporary additions to the statewide point- and area-source inventories.

Table 3-549. Comparison of Project Construction Emissions

Pollutant	State Totals (tons/year)[1]		Estimated Project Construction (tons/year)	Percentage of State Totals	
	2002	2018		2002	2018
NO_2	81,679	104,802	209.7	0.26	0.20
CO	446,701	513,170	1,567.4	0.35	0.31
VOCs	405,705	573,485	219.9	0.054	0.038
SO_2	48,032	43,643	2.2	0.0046	0.0050
PM_{10}	239,981	304,057	239.2	0.10	0.079

Table Notes:
[1]State totals do not include mobile-source emissions.
CO = carbon monoxide
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 microns (coarse particles)
SO_2 = sulfur dioxide

Open Burning of Right-of-Way Vegetation

Open burning of vegetation cleared from the right-of-way during construction would be limited and only conducted if authorized by the land managing agency. Cleared materials would likely be a combination of unspecified forestry wastes and rangeland brush and grasses. Section 2.5 of EPA Publication AP-42, *Compilation of Air Pollution Emissions Factors* (EPA 1992) presents data on waste generation rates and emissions factors for open burning of these types wastes. Based on preliminary data, a conservative estimate that no more than approximately 681 acres of unspecified forest residue may be cleared and burned. These data are used to estimate emissions from open burning activities until a definitive estimate of waste generation rates is developed prior to issuance of the right-of-way. These emissions are included in the B2H Project construction emissions tables above.

Climate Change

Greenhouse Gas Emissions

GHG emissions from construction (primarily CO_2, methane, and nitrous oxide) come primarily from fuel combustion sources. Data for the GHG analysis was derived from the California Climate Action Registry General Reporting Protocol, Version 3.1 (California Climate Action Registry 2009a), and Power Generation/Electric Utility Reporting Protocol, Version 1.1 (California Climate Action Registry 2009b). The direct effects of construction on GHG emissions are estimated to be 53,086 tons over the 3-year construction period. Approximately 8 percent of these emissions, or 4,294 tons of CO_2 equivalent (CO_2e), are allocated to Idaho, and 92 percent of these emissions, or 49,376 tons of CO_2e, are allocated to Oregon. On an annual basis, the estimated B2H Project construction GHG emissions for Oregon and Idaho are 21,945 and 1,908 tons per year, respectively. By comparison the annual emissions would constitute less than 0.04 percent of annual GHG emissions for Oregon and 0.005 percent for Idaho.

The CEQ's August 1, 2016 memorandum for heads of federal departments and agencies suggests that "agencies should be guided by the principle that the extent of the analysis should be commensurate with the quantity of projected GHG emissions and GHG quantification tools that are suitable for and commensurate with the proposed agency action. The rule of reason and the concept of proportionality caution against providing an in-depth analysis of emissions regardless of the insignificance of the quantity of GHG emissions that would be caused by the proposed agency action." Table 3-544 shows GHG emissions inventories for Oregon and Idaho. Considering the inventory totals for the construction-period emissions of CO_2e allocated to each state and the CEQ guidance, the direct effects of GHG emissions from construction of the B2H Project would represent low and short-term contributions to the state annual totals of CO_2e.

Carbon Storage

The BLM Baker Draft RMP states, "The net storage or loss of carbon on rangelands and grasslands in the Planning Area is generally small and difficult to measure. Soils on these sites also contain relatively little organic matter compared to forest soils (Ryan and Archer 2008). Although forests and woodlands makeup only 20 percent of the total acres on public lands in the Planning Area, these vegetation communities sequester and store approximately 72 percent of the carbon [in the Planning Area]" (BLM 2011b:3-5). The Planning Area for the BLM Baker Draft RMP includes all of the forested areas within the B2H Project area for the alternatives. The Draft RMP also provides estimates of the tons of carbon stored aboveground in live and dead vegetation for different types of plant communities as follows (BLM 2011b:3-5, Table 3-1):

- Sagebrush steppe: 1.35 tons per acre
- Mixed grasslands: 0.25 tons per acre
- Mixed grasslands and juniper: 3 tons per acre
- Nonnative annual grass: 0.31 tons per acre
- Nonnative seeded grass: 0.22 tons per acre
- Dry forest: 10 tons per acre

- Moist forest: 64 tons per acre
- Riparian: 2 tons per acre

Estimates of construction disturbance to shrublands and grasslands and combined forest vegetation are presented for the alternative routes in Section 3.2.3. Assuming the highest estimated carbon storage capacity for the two main vegetation types, and assuming all disturbed areas remain disturbed for the duration of construction, construction of the B2H Project would be short-term and have an indirect effect of reducing vegetative carbon storage capacity of shrublands/grasslands by approximately 11,500 tons, and forested areas by approximately 29,000 tons. In the context of available carbon storage in the study corridor and the short-term nature of the disturbance, the indirect construction effects of reduced carbon storage capacity would be low.

Operations

Air Quality

Operations-related emissions would be from the following types of sources and activities:

- Use of motor vehicles to transport inspection and maintenance personnel to the transmission line and associated facilities as required
- Travel on the unpaved access and service roads during the inspection- and maintenance-related activities
- Minor emissions from the use of small stationary engines for emergency power at the proposed communication sites

The following are estimated annual emissions from inspection and maintenance activities during the operations phase:

- Volatile organic compounds: 0.06 ton per year
- Carbon monoxide: 0.40 ton per year
- Nitrogen oxides: 0.65 ton per year
- Sulfur oxides: 0.0005 ton per year
- PM_{10}: 0.64 ton per year
- $PM_{2.5}$: 0.14 ton per year
- CO_2: 63 tons per year

Emissions for the proposed B2H Project operations phase are broken down for each state based on the above-mentioned estimated values and are shown in Table 3-550.

Table 3-550. Operations Emissions Breakdown by State

Pollutant	Oregon Emissions (tons per year)	Idaho Emissions (tons per year)
NO_x	0.60	0.05
CO	0.37	0.03
VOCs	0.055	0.005

Table 3-550. Operations Emissions Breakdown by State		
Pollutant	**Oregon Emissions (tons per year)**	**Idaho Emissions (tons per year)**
SO_x	0.00046	0.00004
PM_{10}	0.59	0.046
$PM_{2.5}$	0.125	0.011
CO_2e	58.0	5.0

Table Notes:
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_x = sulfur oxides
VOCs = volatile organic compounds

Climate Change

Greenhouse Gas Emissions

GHG emissions from operations activities are anticipated to be approximately 63 tons of CO_2 e per year.

Carbon Storage

The B2H Project estimates operations disturbance to approximately 411 acres of shrublands and grasslands and 41 acres of combined forest vegetation. Assuming the highest estimated carbon storage capacity for the two main vegetation types, and assuming all disturbed areas remain disturbed for the duration of construction, construction of the B2H Project would result in the indirect effect of reducing vegetative carbon storage capacity in of shrublands/grasslands by approximately 1,200 tons, and forested areas by approximately 2,600 tons for the long-term of B2H Project operations. In the context of available carbon storage in the study corridor, the proposed B2H Project operations indirect effects of reduced carbon storage capacity would be low.

Corona Discharges

In energized transmission lines, electric fields around a conductor can become concentrated enough to create an electric discharge. This type of discharge, known as a *corona*, ionizes the air around the conductor. The voltage at which the conductor is energized, the conductor shape and diameter, as well as any scratches, dust, and water that have accumulated on the conductor can affect its electrical performance and cause the creation of coronas. Corona forming on the transmission line is a natural phenomenon, and is recognized as a buzzing sound in the vicinity and an energy loss when the line is energized. Ionization of the air can produce gaseous emissions, typically being highest during periods of rain and fog.

A corona on an electrical conductor can produce small amounts of ozone, which constitutes most of what this process generates, along with some nitrogen oxide emissions. Corona levels on the proposed 500-kV line are expected to be very low. The current national standard for ozone emissions is 75 parts per billion over an 8-hour averaging time. The maximum increase in ozone levels at the ground

produced by corona activity on the proposed transmission line would be on the order of 1 part per billion or less.

ALTERNATIVE ROUTES

Air Quality

Table 3-551 represents construction emissions increases and decreases anticipated for each of the alternatives in the Draft EIS as compared with the Proposed Action. To facilitate this comparison, the construction emissions anticipated for each of the alternatives are compared to the portion of the Proposed Action. The first section of the table lists the emissions expected for the Proposed Action in its entirety. The next section shows the emissions anticipated for each alternative in comparison to the Proposed Action, and the net difference in anticipated emissions between the two. The main variable is the relative length of each alternative compared to the Proposed Action. B2H Project operations emissions for the alternatives would be approximately four orders of magnitude less than construction emissions (approximately one ten- thousandth) and would therefore be low.

Climate Change

Greenhouse Gas Emissions

GHG emissions for the construction and operations for the alternatives are similar to those for the Proposed Action, with minor variations in amounts based primarily on the relative length of the line. The maximum variation would be the Longhorn Alternative, which would produce approximately 2,600 fewer tons of GHG during construction than would the Proposed Action, an approximate 5 percent reduction.

Carbon Storage

The effects of the Timber Canyon Alternative on short-term carbon storage capacity during construction and operations differ noticeably from the Proposed Action. Construction of the Timber Canyon Alternative would disturb 357 more acres of combined forest vegetation than the Proposed Action. Compared to the Proposed Action, this disturbance would result in a loss of approximately 23,000 more tons of carbon storage. Most of the area disturbed during construction would be anticipated to return to a preconstruction condition at or within 5 years of the end of construction. However, compared to the Applicant's Proposed Action Alternative, an estimated 41 more acres of disturbance associated with operations on the Timber Canyon Alternative would be remain after 5 years, a doubling of the long-term loss of carbon storage capacity from operations to approximately 5,200 tons.

CONCLUSIONS

Impact analyses indicate ambient standard exceedances are unlikely due to B2H Project construction or operation. Emissions of nitrous oxides (NOx) from construction equipment used to construct the B2H Project may result in short-term, localized NO_2 concentrations above the numerical values of the standards. The ambient standard or particulate matter also would not likely be exceeded.

Table 3-551. Comparison of Emissions by Alternative Route								
Alternative Route	**Length (miles)**	**Emissions[1]**						
		PM_{10}	**$PM_{2.5}$**	**NO_x**	**CO**	**SO_x**	**VOCs**	**CO_2e**
Proposed Action								
Morrow County (Oregon)	45.8	80.8	59.5	70.9	529.6	0.7	74.3	7,971.5
Umatilla County (Oregon)	49.5	87.3	64.4	76.6	572.4	0.8	80.3	8,615.5
Union County (Oregon)	39.4	69.5	51.2	61.0	455.6	0.6	63.9	6,857.6
Baker County (Oregon)	69.1	121.9	89.8	106.9	799.0	1.1	112.1	12,026.9
Malheur County (Oregon)	72.1	127.2	93.7	111.5	833.7	1.2	116.9	12,549.0
Owyhee County (Idaho)	23.8	42.0	30.9	36.8	275.2	0.4	38.6	4,142.4
Proposed 138/69-kV Relocate/Rebuild								
Baker County (Oregon)	5.3	9.4	6.9	8.2	61.3	0.1	8.6	922.5
Proposed Action Totals	305.0	538.1	396.4	471.9	3,526.8	4.9	494.7	53,085.4
Proposed Action and Alternative Action to Substation Comparisons								
Proposed Action Compared to Horn Butte Alternative	33.7	59.5	43.8	52.1	389.7	0.5	54.7	5,865.5
Horn Butte Alternative	26.9	47.5	35.0	41.6	311.0	0.4	43.6	4,681.9
Emissions Difference	-6.8	-12.0	-8.8	-10.5	-78.7	-0.1	-11.1	-1,183.6
Proposed Action Compared to Longhorn Alternative	33.7	59.5	43.8	52.1	389.7	0.5	54.7	5,865.5
Longhorn Alternative	19.0	33.5	24.7	29.4	219.7	0.3	30.8	3,307.0
Emissions Difference	-14.7	-26.0	-19.1	-22.7	-170.0	-0.2	-23.9	-2,558.5
Proposed Action and Alternative Action Comparisons								
Proposed Action Compared to Glass Hill Alternative	7.6	13.4	9.9	11.8	87.9	0.1	12.3	1,322.8
Glass Hill Alternative	7.6	13.4	9.9	11.8	87.9	0.1	12.3	1,322.8
Emissions Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proposed Action Compared to Timber Canyon Alternative	46.3	81.7	60.2	71.6	535.4	0.7	75.1	8,058.5
Timber Canyon Alternative	57.5	101.5	74.8	89.0	664.9	0.9	93.3	10,007.9
Emissions Difference	11.2	19.8	14.6	17.4	129.5	0.2	18.2	1,949.4
Proposed Action Compared to Flagstaff Alternative	14.2	25.1	18.5	22.0	164.2	0.2	23.0	2,471.5
Flagstaff Alternative including 230-kV Rebuild	15.3	27.0	19.9	23.7	176.9	0.2	24.8	2,663.0
Emissions Difference	1.1	1.9	1.4	1.7	12.7	0.0	1.8	191.5

Table 3-551. Comparison of Emissions by Alternative Route

Alternative Route	Length (miles)	Emissions[1]						
		PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOCs	CO_2e
Proposed Action Compared to Malheur S Alternative	30.6	54.0	39.8	47.3	353.8	0.5	49.6	5,325.9
Malheur S Alternative	33.6	59.3	43.7	52.0	388.5	0	54.5	5,848.1
Emissions Difference	3.0	5.3	3.9	4.7	34.7	-0.5	4.9	522.2
Proposed Action Compared to Malheur A Alternative	30.6	54.0	39.8	47.3	353.8	0.5	49.6	5,325.9
Malheur A Alternative	33.2	58.6	43.2	51.4	383.9	0.5	53.8	5,778.5
Emissions Difference	2.6	4.6	3.4	4.1	30.1	0.0	4.2	452.6
Proposed Action Compared to Double Mountain Alternative	7.4	13.1	9.6	11.4	85.6	0.1	12.0	1,288.0
Double Mountain Alternative	7.4	13.1	9.6	11.4	85.6	0.1	12.0	1,288.0
Emissions Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table Notes:
[1]Emission rates are in tons per period.
CO = carbon monoxide
CO_2e = carbon dioxide equivalent
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns (coarse particles)
$PM_{2.5}$ = particulate matter less than 2.5 microns (fine particles)
SO_x = sulfur oxides
VOCs = volatile organic compounds

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3.2.17 Socioeconomics and Environmental Justice

3.2.17.1 Introduction

This section describes the current social, economic, and environmental justice conditions within the analysis area. This includes analysis of trends, current conditions and other factors pertaining to social, economic, and environmental justice indicators to provide an accurate assessment of baseline conditions in the B2H Project area relative to Oregon, Idaho and the U.S.

3.2.17.2 Regulatory Framework

Federal

NEPA or CEQ regulations do not provide specific thresholds of significance for socioeconomic impact assessment, because significance is contextual in nature and varies with the setting of the Proposed Action (40 CFR 1508.27(a)).

The BLM, as the lead agency, requires the utilization and evaluation of social science in the preparation of informed, sustainable land-use planning decisions. The FLPMA requires the BLM to integrate physical, biological, economic, and other sciences in developing land-use plans (43 U.S.C. 1712(c) (2)). FLPMA regulations 43 CFR 1610.4-3 and 1610.4-6 also require the BLM to analyze social, economic, and institutional information. In addition, the NEPA requires federal agencies to "insure the integrated use of the natural and social sciences…in planning and decision making" (42 U.S.C. 4332(2) (A)).

The BLM is required to manage public lands based on multiple use and sustained yield, and to meet the needs of present and future generations. As the human population continues to increase and social values evolve, resource conflicts are likely to increase. The American public is increasingly aware of the importance of the public lands to its well-being and is demanding a larger voice in resource management decisions. Given these realities, the planning process can represent a constant balancing of competing needs, interests, and values. The effective use of social science can be critical to understanding and reconciling these differing perspectives.

The BLM Land Use Planning Handbook (BLM Handbook H-1601-1) states that social science information can include the economic, political, cultural, and social structure of communities, regions, and the nation as a whole; social values, beliefs, and attitudes; how people interact with the landscape; and sense-of-place issues. The social sciences integrate a wide variety of disciplines, generally including economics, sociology, demography, anthropology, archaeology, political science, geography, history, and landscape architecture. Though the information appropriate to a given analysis depends on the specific issues being assessed, the social science information usually important to resource planning decisions can be grouped in the following categories (BLM 2005):

- Demography and social indicators
- Social organization and institutions
- Attitudes and values
- Human geography

- Economic value
- Employment, income, and subsistence
- Public finance and government services
- Environmental justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to make the achievement of environmental justice part of its mission by identifying and addressing disproportionately high and adverse human-health or environmental effects of its programs, policies, and activities on minority and low-income populations. The Executive Order further demands that the agencies conduct their programs and activities in a manner that does not exclude persons from participation because of their race, color, or national origin.

STATE OF OREGON

Oregon requires that a site certificate from the Oregon Energy Facility Siting Council (EFSC) be obtained. EFSC must find that construction and operation of the facility, taking into account mitigation, is not likely to result in significant adverse impacts on the ability of public and private providers to provide public services. The public services identified by EFSC are as follows: sewers and sewage treatment, water, storm-water drainage, solid-waste management, housing, traffic safety, police and fire protection, health care, and schools (Oregon Administrative Code 345-022-0110).

STATE OF IDAHO

There are no regulatory requirements in Idaho.

3.2.17.3 ISSUES IDENTIFIED FOR ANALYSIS

The analyses incorporated the following social and economic, and environmental justice-related issues that were raised by the public, Native American tribes, or federal and state agencies during scoping or are issues that must be considered as stipulated in law or regulation.

- Would the B2H Project reduce property values, and, therefore, reduce the amount of state and local tax revenues?
- What is the potential impact on the Umatilla Indian Reservation? And, would the B2H Project affect the tribal use of land?
- Will the B2H Project affect high valued agriculture operations within the study area?
- Will the B2H Project affect local electricity rates?
- What is the potential for disproportionate adverse impacts on minority and low-income communities?
- How will the B2H Project affect local quality of life and business?
- Will there be a loss of income to local businesses?

3.2.17.4 METHODS

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Sections 3.1.2 and 2.5.1. This section discusses how the study methods are applied to assess the impacts of the B2H Project on socioeconomics and environmental justice.

The methods to estimate the social and economic, and environmental justice effects of the B2H Project relies on secondary data compiled from federal, state, and local government sources. Key sources of data for the analysis area include:

- U.S. Census Bureau
- U.S. Bureau of Economic Analysis
- U.S. Bureau of Labor Statistics
- State of Oregon
- State of Idaho

Regional economic impacts were estimated using a multi-county input-output model developed using Impact Analysis for Planning (IMPLAN) modeling software and data (Minnesota IMPLAN Group 2014); 2014 data with the IMPLAN 3.0 was used to estimate economic impacts of the B2H Project.

State and local governments were contacted for data on potentially affected community services, including solid-waste management, police, fire protection and emergency response, health care, and schools. The potential effects of the B2H Project are evaluated with respect to the key aspects of the socioeconomic environment, including demographic characteristics, housing, economic conditions, property values, community services, and tax revenues. These evaluations employ different resource-specific analysis methods that are described in their respective sections.

Key B2H Project-related income generating indicators used in the socioeconomic analysis include projected construction employment and expenditures. Operations-related employment and expenditures also are used in the analysis. These estimates represent the best available information and a reasonable approximation of the likely distribution of potential impacts but should not be considered precise forecasts. In most cases, estimated impacts may be compared with the existing conditions data presented in this section.

The environmental justice component of this analysis involves identifying whether the proposed B2H Project would result in disproportionately high and adverse impacts on minority and/or low-income populations. This typically involves two steps: (1) identifying whether minority and/or low-income communities are present in the analysis area and (2) if these types of communities are present, evaluating whether high and adverse human-health or environmental effects will disproportionately affect the identified communities.

Data from the U.S. Census Bureau are used to identify minority and/or low-income communities that could be affected by the B2H Project. The results of other resource-specific analyses conducted for the B2H Project are used to evaluate the potential for adverse or human-health effects.

3.2.17.5 Affected Environment

Overview of B2H Project Area

The B2H Project is intended to connect the Pacific Northwest and Intermountain regions to alleviate existing transmission constraints and ensure sufficient capacity to meet the region's forecasted load requirements. This proposed line would cross five counties in Oregon *(Baker, Malheur, Morrow, Umatilla, and Union)* and one county in Idaho *(Owyhee)* with single-circuit 500-kV electric transmission line. To connect the northern terminus, the Longhorn Substation, a substation planned by BPA approximately 4 miles east of the city of Boardman in Morrow County, Oregon, to the existing Hemingway Substation, near the city of Melba in Owyhee County, Idaho.

The following section provides a brief description of the six counties that may be crossed by the B2H Project. Collectively, these counties account for the B2H Project area.

Morrow County, Oregon

Morrow County spans 1.3 million acres along the Columbia River in northern Oregon. Early cattlemen moving west found an abundance of rye grass along creek bottoms and drove their herds into the area to forage on these natural pastures. Settlements sprang up around these early cattle camps, and in 1885 the county was created from the western portion of Umatilla County and a small portion of eastern Wasco County. Farming and ranching was the primary economic force in the county for many years, and continues to be an integral part of the social and economic fabric of local communities within Morrow County (Oregon Secretary of State n.d.c).

Approximately 83 percent of the county's lands are under private ownership, with federal agencies (≈ 17 percent) and state agencies (approximately 0.3 percent) administering the remaining 232,000 acres. In 2014, Morrow County had a population of 11,187 people, which represented a 0.1 percent increase from its 2010 population of 11,173. The county can be considered rural, with a population density of only 5.5 people per square mile (U.S. Census Bureau 2015). The county seat is Heppner and its largest city is Boardman, which reportedly had a population of 3,660 people in 2010 (U.S. Census Bureau 2010).

Local communities within Morrow rely heavily on natural resources for their livelihoods. Principal industries within the county include agriculture, food processing, lumber, livestock, and outdoor recreation. More than 91 percent of the county is devoted to agricultural purposes (e.g., farming, ranching, and forestry) and it consistently ranks as one of the state's top agriculture producing counties. According to the 2012 Census of Agriculture, Morrow County's agricultural production was valued at more than $568 million. Its 2012 sales of vegetables, melons, and potatoes; cattle and calves; and milk ranked number 1 in the state; and sales of grains, oilseeds, dry beans, and dry peas ranked number 2 (USDA 2012).

Although agriculture is known to play a critical role in the local economy, its significance tends to be under-represented in traditional labor statistics since the distinction between farm and family is not well defined. In 2014, farm employment accounted 16 percent of employment and 30 percent of income

within Morrow County (BEA 2014). These statistics, however, only reflect the hired farmworkers and do not account for the unpaid labor provided by family members. While hired agricultural workers often fill a labor gap during peak seasons, they are estimated to make up only one-third of the total workforce in the agricultural sector (Kandel 2008). When labor contributions of unpaid family workers are considered alongside those of hired agricultural workers, the agricultural sector is revealed to play a much larger role in most rural areas.

In 2014, services related sectors still accounted for more than 40 percent of total local employment. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (11.4 percent of total jobs); professional and business (4.3 percent of total jobs); education and health (2.9 percent of total jobs); and leisure and hospitality (9 percent of total jobs). The three service sectors that paid the highest wages were trade, transportation, and utilities ($54,845); financial activities ($36,592); and education and health ($29,388) (U.S. Census Bureau 2015).

Umatilla County, Oregon

Umatilla County is located in north central Oregon, bordering Morrow and Union counties. Originally influenced by the Oregon Trail, fertile lands, and the discovery of gold; Umatilla County was officially founded in 1862. Quality rangelands allowed for the development of the livestock and dry-land wheat farming industry, which spurred tension between newly arrived homesteaders and Native American tribes. By 1855, tribes in the area were forced to cede 6.4 million of acres of land in exchange for a 172,000-acre reservation in the Treaty of 1855. The Treaty of 1855 reserved the rights of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to fish, hunt, and gather on the 6.4 million acres ceded to the U.S. Government (CTUIR n.d.). Further expansion of the county occurred in the late 1880s when the railroad was established in the area (Oregon Secretary of State n.d.d).

Umatilla spans more than 2 million acres. Approximately 21 percent of these lands are managed by federal agencies, 0.9 percent were in state ownership, nearly 14 percent are tribal lands, and the remaining 64 percent of land is privately owned. The Umatilla Indian Reservation is a federally recognized confederation of three Sahaptin-speaking Native American tribes who traditionally inhabited the Columbia River Plateau region: the Cayuse, Umatilla, and Walla Walla. Collectively, the CTUIR has approximately 2,965 tribal members. Nearly half of those tribal members live on or near the 172,000 acre Umatilla Reservation. The Umatilla Reservation also is home to another 300 Native Americans who are members of other tribes. About 1,500 non-Native Americans also live on the reservation; 30 percent of CTUIR membership is composed of children under age 18, and 15 percent are elders over age 55 (CTUIR n.d.).

In 2014, Umatilla County had a population of 76,705 people, which represented a 0.01 percent increase from its 2010 population of 75,889. This translates to a county population density of approximately 5.5 people per square mile (U.S. Census Bureau 2015). The county seat is Pendleton and its largest city is Hermiston with a 2010 population of 16,745 people (U.S. Census Bureau 2010). Umatilla County towns along or near the proposed route include Gopher Flats, Mission, Pilot Rock, Pendleton, Riverside and Tutilla.

Farming and ranching continues to be a vital part of the social and economic well-being of local communities within Umatilla County. The county is consistently ranked as one of Oregon's top agriculture producing counties and is home to the Pendleton Round-Up Rodeo, which attracts roughly 50,000 people to the area each year (Pendleton Round-Up n.d. According to the 2012 Census of Agriculture, there were 1,603 farms growing more than $423 million in agricultural products in 2012 The county's top agricultural products included grains, vegetables, melons, and potatoes (USDA 2012).

Many farm families supplement their household income through off-farm employment in the service related sector. In 2014, service related industries supported more than 57 percent of overall local employment. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (20.8 percent of total jobs), education and health (11.1 percent of total jobs), and leisure and hospitality (8.3 percent of total jobs) The three service sectors that paid the highest wages were professional and business ($55,564), financial activities ($41,968), and education and health ($38,752) (U.S. Census Bureau 2015).

Union County, Oregon

Union County is located in northeastern Oregon bordering Baker, Grant, Umatilla and Wallowa counties. It was officially founded in 1864 after lands from Baker and Umatilla counties were split to form the new county. Like other parts of this region, early settlement was attributed to quality rangelands, fertile soils, mineral potential, and proximity to the Oregon Trail. Today, agriculture, outdoor recreation and tourism, and timber industries continue to be an important part of the area's economy (U.S. Census Bureau 2010).

Today Union County spans more than 1.3 million acres with approximately 46 percent of land area administered by federal agencies, 0.6 percent under state ownership, and 0.2 percent are tribal lands, while the remaining 53 percent of land was privately owned. In 2014, Union County had a population of 25,691 people, which represented a less than 0.01 percent decrease from its 2010 population of 25,748. This translates to a county population density of approximately 12.6 people per square mile (U.S. Census Bureau 2015). Its county seat and largest city was La Grande, with a 2010 population of 13,082 people (U.S. Census Bureau 2010). Union County towns along or near the proposed route include Hot Lake, Island City, La Grande, and Union.

In 2014, services related sectors accounted for 54 percent of total employment. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (19.4 percent of total jobs); education and health (15.4 percent of total jobs); and leisure and hospitality (8.8 percent of total jobs). The three service sectors that paid the highest wages were education and health ($42,082), financial activities ($36,556), and professional and business ($35,922) (U.S. Census Bureau 2015).

Baker County, Oregon

Baker County is located in the southeastern Oregon, bordering Idaho along the Snake River. Originally influenced by the Oregon Trail and the discovery of gold in the 1860s, Baker County was founded in

1862 with a booming mining industry that was once the largest gold producer in the Pacific Northwest (Oregon Secretary of State n.d.a). In the late 1980s, there was a push to revive Baker County's historic buildings and Oregon Trail Heritage. Tourists are attracted to Baker County because of the availability of various outdoor activities available, including hunting, fishing, skiing, historic parks and wilderness areas.

Today Baker spans more than 1.9 million acres with approximately 51 percent managed by federal agencies, 0.5 percent under state ownership, while the remaining 48 percent of land was private. In 2014, Baker County had a population of 16,059 people, which represented a 0.5 percent decrease from its 2010 population of 16,134. This translates to a county population density of approximately 5.2 people per square mile (U.S. Census Bureau 2015). Its county seat and largest city is Baker City, with a 2010 population of 9,828 people (U.S. Census Bureau 2010). Baker County towns along or near the proposed route: Baker City, Durkee, Haines, Huntington, Keating, Lime, North Powder, and Weatherby.

In 2014, services related sectors accounted for 79 percent of total employment. The three service sectors that employed the highest proportion of people were trade, transportation, utilities (19.7 percent of total jobs), education and health (14.6 percent of total jobs), and leisure and hospitality (11.6 percent of total jobs). The three service sectors that paid the highest wages were information ($38,664), financial activities ($38,224), and education and health ($38,048) (U.S. Census Bureau 2015).

Malheur County, Oregon

Malheur County is located in southeastern Oregon, bordering Idaho to the east and Nevada to the south. Settlement in the area began in the early 1860s and was influenced by fur trapping, mining, and livestock production (Oregon Secretary of State n.d.b).Today, Malheur County is Oregon's second largest county and farming and ranching continue to be an integral part of the area's economy (U.S. Census Bureau 2010).

The county spans more than 6.3 million acres with approximately 73 percent managed by federal agencies, 4.5 percent are in state ownership, 0.3 percent are tribal lands, and the remaining 22 percent of land was privately owned. In 2014, Malheur County had a population of 30,359 people, which represented a 3 percent decline from its 2010 population of 31,313. This translates to a county population density of approximately three people per square mile (U.S. Census Bureau 2015). The county seat is Vale, and its largest city is Ontario with a 2010 population of 11,366 people (U.S. Census Bureau 2010). Malheur County towns along or near the proposed route include Adrian, Brogan, Harper and Westfall

Malheur is ranked fourth in the state for agricultural production behind Marion, Umatilla and Morrow counties. According to the 2012 Census of Agriculture, the county had 1,113 farms operating on more than 1.07 million acres of land in 2012. The total value of its agricultural production exceeded $359 million, with its top commodities including corn, vegetables, cattle and calves, and hay and forage (USDA 2012).

The majority of local employment is supported by industries in the service sector. In 2014, the service sectors supported more than 80 percent of total employment within the county. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (23.9 percent of total jobs); education and health (13.4 percent of total jobs); and leisure and hospitality (9 percent of total jobs). The three service sectors that paid the highest wages were financial activities ($36,510), education and health ($35,843), and professional and business ($34,164) (U.S. Census Bureau 2015).

Owyhee County, Idaho

Owyhee County is located in the southwestern corner of Idaho, bordering Nevada and Oregon. Originally part of the Oregon Trail's southern route, Owyhee was founded in 1863 as the territory's first county. Early industries that supported commerce in the area included fur trapping, mining (gold and silver), ranching and farming (Owyhee County n.d.).

Today Owyhee spans more than 4.9 million acres with approximately 85 percent managed by federal or state government agencies and 15 percent private and tribal owned lands. In 2014, Owyhee County was reported to have a population of 11,353 people, which represented a 1.5 percent decrease from its 2010 population of 11,526. This translates to a county population density of approximately 1.48 people per square mile (U.S. Census Bureau 2015). The county seat is Murphy, and its largest city is Homedale with a 2010 population of 2,633 people (U.S. Census Bureau 2010).

In 2014, more than 50 percent of county employment was supported by service related sectors. The three service sectors that employed the highest proportion of people were trade, transportation, and utilities (11.6 percent of total jobs); leisure and hospitality (5.2 percent of total jobs); and professional and business (5 percent of total jobs). The three service sectors that paid the highest wages were financial activities ($47,156); professional and business ($43,295); and trade, transportation, utilities ($38,456) (U.S. Census Bureau 2015).

REGIONAL SETTING

This section analyzes the current conditions and trends related to the social and economic environment of the planning area, including population and demographic changes, potential environmental justice populations, and employment and income conditions.

Although the proposed B2H Project crosses six counties in eastern Oregon (Baker, Malheur, Morrow, Umatilla, and Union) and western Idaho (Owyhee), regional trade flows and local commuting patterns suggest communities in neighboring counties also may be affected by the B2H Project. Since housing availability within the six-county B2H Project area is relatively limited, workers who construct and maintain the proposed transmission line may reside (permanently or temporarily) in Gilliam County, Oregon and Ada and Canyon counties in Idaho. To account for these broader social and economic linkages, the relevant geographical scope of the socioeconomic analysis has been expanded to assess potential impacts on an expanded area of influence. These nine counties are collectively referred to as the socioeconomic study area.

Land Ownership and Uses

The area surrounding the proposed B2H Project is generally considered rural, with a large portion of the land base reserved for agricultural and natural resource-related activities. In 2013, more than 90 percent of the land surrounding the B2H Project was associated with farm production or administered as public lands by federal, state, and local agencies. Counties with more than 50 percent of their land base dedicated to agricultural uses included Canyon, Gilliam, Morrow, and Umatilla counties; while more than 50 percent of Ada, Owyhee, and Malheur were under public ownership (Table 3-552).

Table 3-552. Land Ownership and Uses

Area	Total Acres	Percent of Total Land in Farms[1]	Percent of Public Lands (Federal, State and Municipal)	Percent of Private Lands	Percent of Tribal Lands
Gilliam County, Oregon	782,609	92	8	91	0
Morrow County, Oregon	1,311,061	89	18	82	0
Umatilla County, Oregon	2,068,095	63	22	64	14
Union County, Oregon	1,301,865	32	47	53	0
Baker County, Oregon	1,975,055	36	51	49	0
Malheur County, Oregon	6,354,985	17	78	22	0
Canyon County, Idaho	386,019	79	7	93	0
Ada County, Idaho	678,687	21	57	43	0
Owyhee County, Idaho	4,925,869	15	85	12	3
6-County Project Area	17,936,930	30	61	34	3
9-County Study Area	19,784,245	33	60	37	2
Idaho	53,333,686	22	68	30	2
Oregon	61,930,355	26	56	42	2
United States	2,286,279,509	40	37	59	4

Table Source: U.S. Geological Survey 2012
Table Note: [1]Land in farm use can be administered privately; tribally; or by federal, state, and local governments.

Construction of new segments of this transmission line would require additional rights-of-way grants and easements between the Applicant and federal, state, and local governments; and private landowners. Rights-of-way for transmission line facilities on private lands would be obtained as perpetual easements by the Applicant.

Although easements do not grant ownership rights, they provide non-possessory rights that may still affect the usage and value of land to varying degrees. Land uses potentially affected by the B2H Project include farming and agricultural production, timber, and outdoor recreation and tourism; and are further discussed below in the *Employment and Specialization* section.

Population Demographics and Structure

Population is an important consideration in managing natural resources. In particular, population structure (size, composition, density, etc.) and population dynamics (how the structure changes over time) are essential to describing the consequences of public land management on the social

environment (Seesholtz et al. 2004). This section highlights population and demographic trends in the relevant study area.

Population Size

The nine-county area of influence experienced considerable growth over the last decade. Between 2000 and 2013 its total population increased by 22 percent, nearly double the national rate (Table 3-553). Much of this growth, however, was concentrated within Ada and Canyon counties. Located in southwest Idaho, these counties account for a large portion of the Boise Metropolitan Area and contain the state's three largest cities – Boise, Nampa, and Meridian.

When excluding Ada and Canyon counties, recent population growth along the proposed B2H Project route appears to have been much more conservative. While state and national estimates experienced double-digit growth over the last 13 years, the six counties crossed by the B2H Project increased by 4 percent collectively. The region's sluggish growth was characterized by modest growth in Morrow, Owyhee, Umatilla, and Union counties; and small population declines in Baker and Malheur counties (U.S. Census Bureau 2013).

Table 3-553. Population Estimates: 2000, 2010, and 2013

Area	Year			Percentage of Growth Rate
	2000	2010	2013[1]	2000 to 2013
Gilliam County, Oregon	1,915	1,871	1,915	0
Morrow County, Oregon	10,995	11,173	11,218	2
Umatilla County, Oregon	70,548	75,889	76,306	8
Union County, Oregon	24,530	25,748	25,741	5
Baker County, Oregon	16,741	16,134	16,055	-4
Malheur County, Oregon	31,615	31,313	30,898	-2
Canyon County, Idaho	131,441	188,923	192,153	32
Ada County, Idaho	300,906	392,365	401,673	25
Owyhee County, Idaho	10,644	11,526	11,474	7
6-county Project Area	165,073	171,783	171,692	4
9-county Study Area	599,335	754,942	767,433	22
Idaho	1,293,953	1,567,582	1,595,728	19
Oregon	3,421,399	3,831,073	3,899,353	12
United States	281,421,906	308,758,105	321,216,397	12

Table Source: U.S. Census Bureau 2012a, 2013

Table Note: [1]2013 estimates are population estimates from the 5-Year American Community Survey

Age and Gender

Aside from population size, age and gender structure can be the most influential demographic characteristic. The age-sex structure, or proportion of males and females at different age groups, is the cumulative result of trends in fertility, mortality, and migration. Examining these distributions can provide valuable insight in to past, present, and future socioeconomic issues, and better enable local planners to meet the evolving needs of its residents.

Over the last 30 years, gender distributions have remained relatively stable as general aging has emerged as the most noteworthy demographic trend. Today, one in three Americans is 50 or older, and by 2030 one out of every five people in the U.S. is expected to be 65 years or older (U.S. Census Bureau 2012a). In 2013, median age in the U.S. had reached 37.3 years; with median ages reaching 42.7 and 36.1 years, respectively, in rural and urban areas (U.S. Census Bureau 2014). Although populations across the U.S. are aging, "amenity migration[3]" and "brain drain[4]" have become driving forces behind rapid population changes in rural areas, likes those surrounding the B2H Project area.

Narrowing focus to the B2H Project socioeconomic study area, the proportion of males to females appears to be relatively even, while the overall age structure is slightly older than general populations (Figure 3-4). Of the nine counties examined in the socioeconomic study area, populations in five were older than their respective state's general population. Populations in this region also appear to be aging much more rapidly than they are growing. As shown below in Figure 3-4, populations 45 years or older increased considerably more than age groups less than 45. This suggests that the underlying age structure of communities surrounding the B2H Project is continuing to transition to a more elderly population.

Race and Ethnicity

As shown in Table 3-554, populations within the socioeconomic study area are predominately white and significantly less diverse than the general U.S. populations. In 2013, minority populations accounted for less than 10 percent of the 9-county B2H Project area's total population. While minorities appear to be under-represented when you look at the aggregated population, some minority populations live in higher concentrations than their distribution at the state and national levels. Examples of geographically concentrated minority populations include Native Americans in Owyhee, Baker, and Umatilla counties; individuals of some other race in Malheur and Morrow; and bi/multi-racial individuals in Owyhee, Malheur, Morrow, and Umatilla counties (Table 3-554).

[3]Amenity migration is a term used to describe a growing trend where individuals choose to relocate to amenity-rich places because of quality of life factors. Amenity migration has been tied to geographic regions characterized as having warmer average temperatures, lower rates of crime and taxes, increased access to outdoor settings and recreational activities, and fewer disamenities often attributed to larger cities (i.e., congestion, impaired air and water quality, etc.) (Clark and Davies 1990; Conway and Houtenville 1998; McGranahan 1999; Serow and Haas 2002).

[4]Brain drain is the tendency of young and well-educated individuals to migrate out of rural areas to pursue more diverse or specialized economic opportunities.

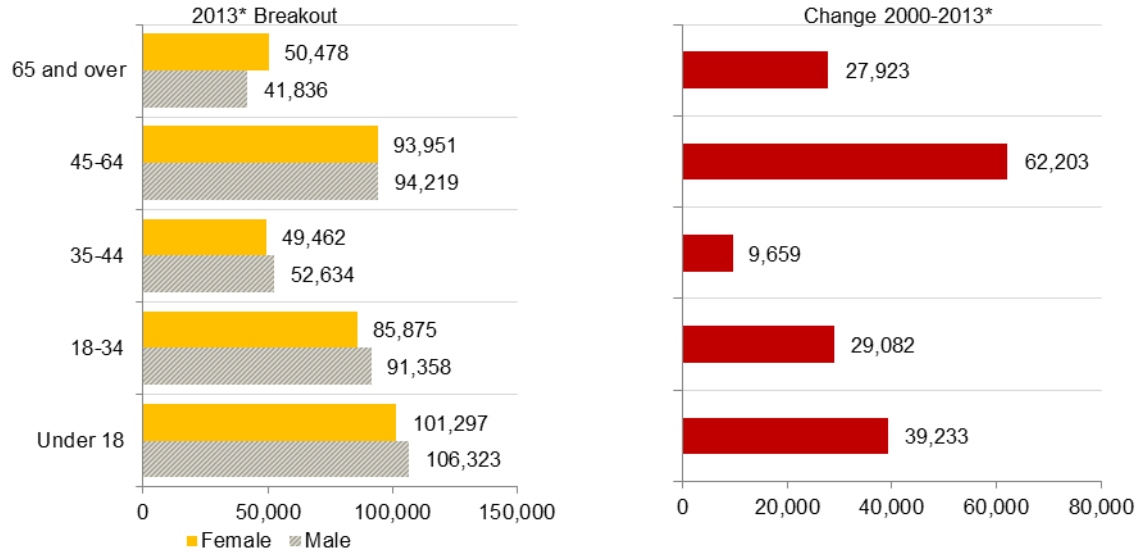


Figure Source: U.S. Census Bureau 2014.

Figure 3-4. Age and Gender Distribution and Change for the Nine County Study Area, 2000 to 2013

Table 3-554. Percentage of Racial Distribution and Ethnicity of the Socioeconomic Study Area, 2013

Area	White Alone	Black or African American Alone	Native American Alone	Asian Alone	Native Hawaiian and Other Pacific Alone	Some Other Race Alone	Two or More Races	Hispanic or Latino
Gilliam County, Oregon	95.6	0.5	0.8	0	0.3	1.5	1.3	8.2
Morrow County, Oregon	88.7	0.2	0.5	0.6	0.1	5.9	3.9	32.3
Umatilla County, Oregon	87.5	0.6	2.1	0.8	0.1	4.4	4.5	24.3
Union County, Oregon	93.6	0.6	0.4	1	0.9	0.7	2.9	4.1
Baker County, Oregon	95.4	0.3	1.3	0.5	0.1	0.2	2.2	3.5
Malheur County, Oregon	82.9	1.2	0.7	1.8	0.2	8.3	4.9	32.1
Canyon County, Idaho	91.4	0.4	0.8	0.8	0.1	3.2	3.2	24.1
Ada County, Idaho	91.7	1	0.5	2.6	0.2	1.3	2.7	7.3
Owyhee County, Idaho	89.6	0	3.3	0.1	0	3.1	3.8	25.7
Idaho	91.9	0.6	1.3	1.3	0.1	2.3	2.5	11.4
Oregon	85.2	1.8	1.2	3.8	0.4	3.7	3.8	11.9
United States	74	12.6	0.8	4.9	0.2	4.7	2.8	16.6

Table Source: U.S. Census Bureau 2013.

Table Note: Since race and ethnicity are not mutually exclusive, persons comprising the Hispanic or Latino group will also fall into one of the racial categories. Therefore, rows wills add up to more than 100 percent.

In addition to identifying with distinct racial groups based on physical attributes, many Americans also define themselves by the cultural heritage from which they descend. Although these individuals may have physical traits associated with white, Black, Asian, or some other racial group, they also may strongly identify themselves by the native language and cultural traditions of the region where their families originated. This is especially common among Americans of Hispanic, Latin, or Spanish descent.

In 2013, nearly 17 percent of Americans and 15 percent of the socioeconomic study area described their family ancestry as being Hispanic, Latin, or Spanish (U.S. Census Bureau 2013). Hispanic and Latino populations were highly concentrated in Canyon and Owyhee, Idaho; and in Malheur, Morrow, and Umatilla, Oregon.

Economic Characteristics

The previous section discussed demographics and population trends in counties surrounding the B2H Project relative to state and national statistics. The following section will focus on economic conditions within the study area to develop further a baseline on which potential impacts can be measured against.

Unemployment

Unemployment rates measure the percent of the local work force that is jobless but actively seeking employment (BLS 2015). Though public officials strive for full-employment, structural unemployment (mismatch between labor skills and available jobs within a region) and frictional unemployment (people moving or transitioning employment) cause rates to persist even in times of economic prosperity. The existence of structural and frictional unemployment implies that there is an inherent “natural” rate of unemployment. The natural rate of unemployment is believed to fall somewhere between 5 and 6 percent and allows workers to move between jobs and industries without signaling broad economic distress.

Figure 3-5 depicts annual average unemployment rates of the socioeconomic study area relative to state and national statistics between 1994 and 2014. Over the last 20 years, unemployment across the U.S. has fluctuated between 4 and almost 9.6 percent (Figure 3-6). During this period, state statistics reveal that unemployment in Idaho was consistently lower than national levels, while unemployment in Oregon tended to be higher.

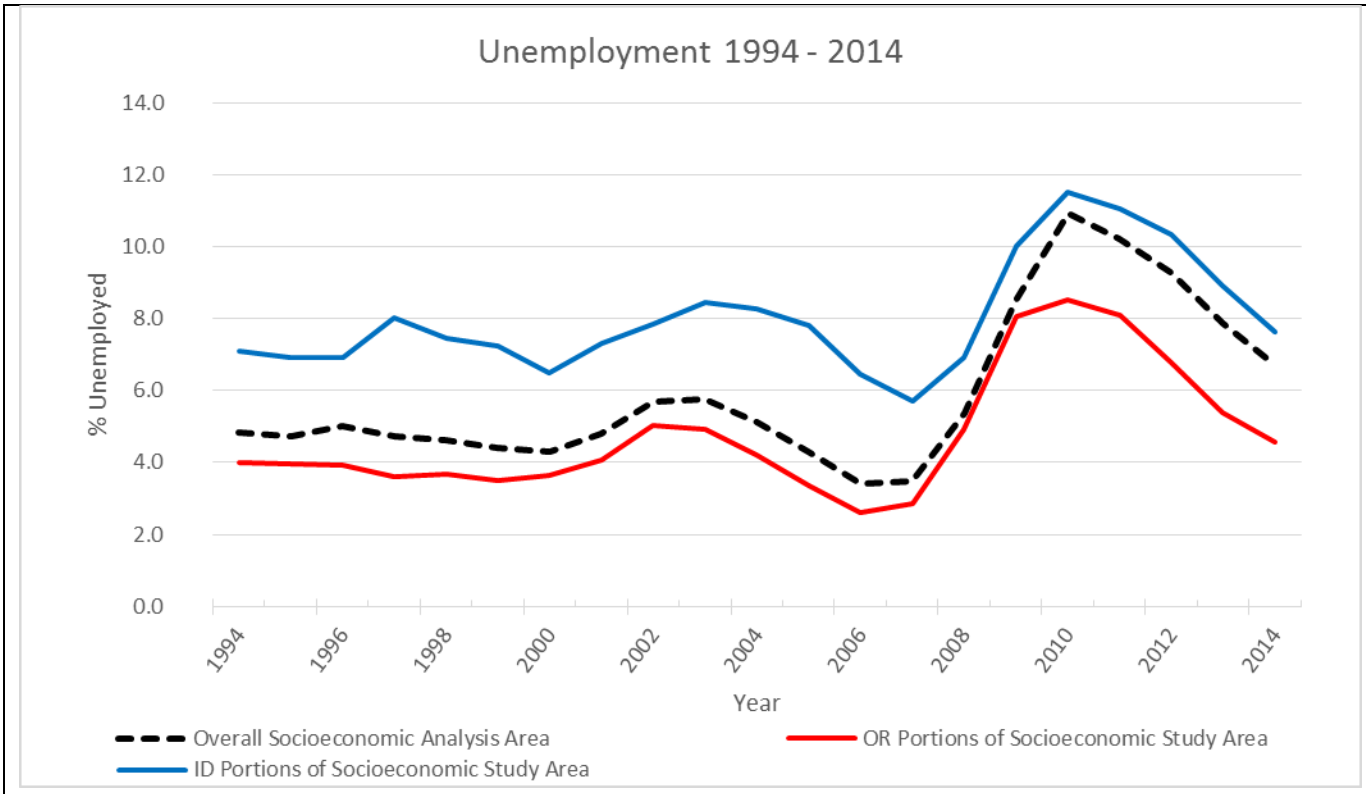


Figure Source: BLS 2015

Figure 3-5. Average Annual Unemployment Rates 1994-2014, within Socioeconomic Study Area

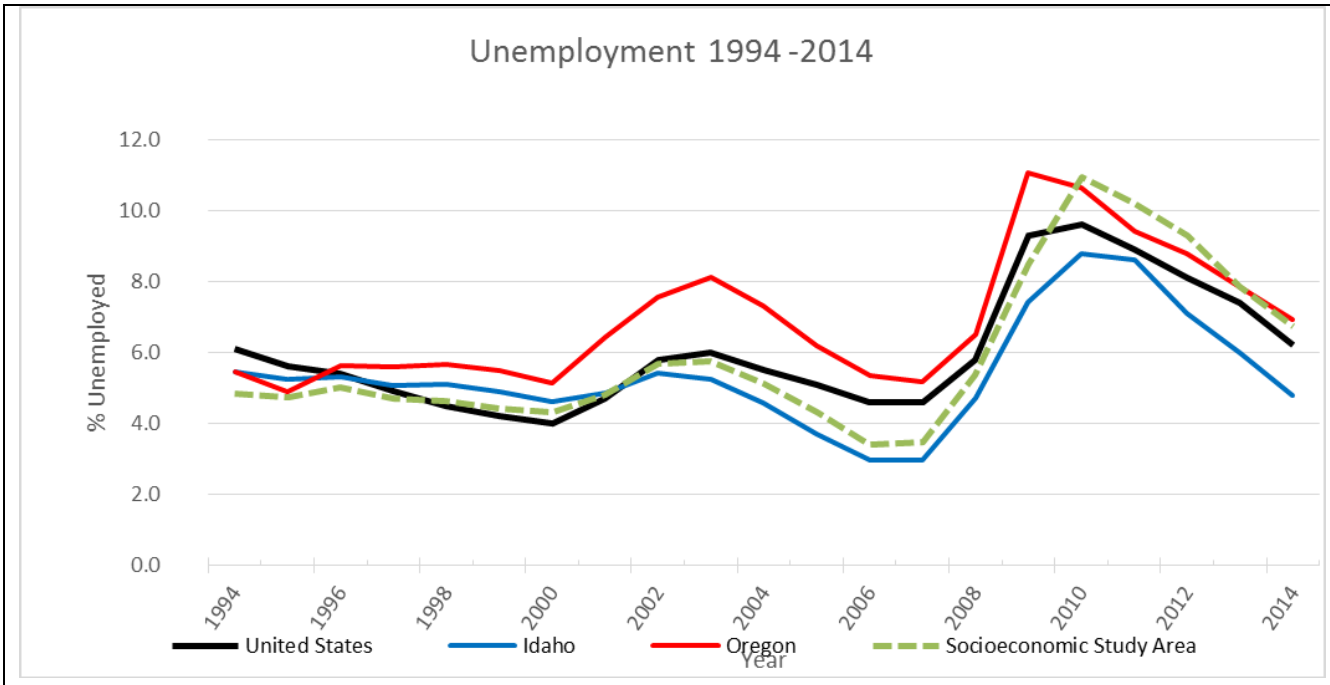


Figure Source: BLS 2015

Figure 3-6. Average Annual Unemployment Rates 1994-2014

Unemployment rates for the socioeconomic study area followed overall trends across Idaho and Oregon (Figure 3-6). Closer examination of rates within the socioeconomic study area, however, reveal that the Oregon portion of the analysis area has a lower proportion of unemployed workers than the Idaho portion of the socioeconomic study area (Figure 3-6). This suggests that eastern Oregon may be more resilient, while western Idaho is less resilient, to changes in regional economic conditions.

Employment

Employment can generally be classified into three main categories: services related, non-services related, and government. Services related sectors support jobs in Utilities, Wholesale Trade, Retail Trade, Transportation and Warehousing Information, Finance and Insurance, Real Estate and Rental and Leasing, Professional, Scientific, and Tech., Mgmt. of Companies and Enterprises, Administrative and Support Services, Educational Services, Health Care and Social Assistance, Arts, Entertainment, and Recreation, Accommodation and Food Services, and Other Services sectors. Employment in non-services related sectors include Mining, Construction, Manufacturing, and Agriculture, Forestry, and Fishing.

Between 2005 and 2014, employment in the socioeconomic study area increased by nearly 38,564 jobs with total employment rising from 421,092 jobs to 459,656 (Table 3-555). Over the last 9 years, employment in the service sector increased by 36 percent while employment in non-services and government sectors fell by 16 percent and increased by 14 percent, respectively. By 2014, employment in the service sector accounted for approximately 68 percent of total regional employment. Although the region exhibited signs of job growth, most of these new jobs were created in the service related sectors, which generally pay lower wages than non-service and government related sectors (Table 3-556 *Average Annual Labor Earnings by Sector*). This would suggest that average earnings per job have actually fallen as total region employment has increased.

Table 3-555. Employment by Industry 2005, 2010, 2014

	2005 Jobs	2010 Jobs	2014 Jobs	Change 2005 to 2014
Total Employment (number of jobs)	421,092	427,196	459,656	32,460
	Percentage of Total Employment			***Percentage of Change***
Non-Services Related	**22.1**	**17.4**	**18.0**	**11.3**
Farm	3.6	3.6	3.4	0.7
Forestry, fishing, and ag. services	0.9	0.9	0.9	12.9
Mining (including fossil fuels)	0.2	0.2	0.3	90.5
Construction	7.9	5.4	5.8	15.0
Manufacturing	9.5	7.3	7.5	11.7
	Percentage of Total Employment			***Percentage of Change***
Services Related	**64.3**	**68.1**	**68.6**	**8.2**
Utilities	0.3	0.4	0.4	14.0
Wholesale trade	3.4	3.4	3.6	15.8
Retail trade	11.4	11.2	11.1	7.1
Transportation and warehousing	2.9	2.9	3.0	10.6

Table 3-555. Employment by Industry 2005, 2010, 2014				
	2005 Jobs	2010 Jobs	2014 Jobs	Change 2005 to 2014
Information	1.5	1.5	1.4	0.7
Finance and insurance	3.8	4.5	4.4	5.0
Real estate and rental and leasing	4.3	4.8	4.6	3.4
Professional and technical services	4.9	5.5	5.6	9.9
Management of companies and enterprises	1.4	1.1	1.0	-0.6
Administrative and waste services	6.8	7.1	6.7	1.5
Educational services	1.4	1.7	1.7	5.5
Health care and social assistance	9.9	11.6	11.7	8.5
Arts, entertainment, and recreation	1.5	1.8	2.0	18.0
Accommodation and food services	6.0	6.0	6.4	15.7
Other services, except public administration	4.8	4.7	4.8	11.2
	Percentage of Total Employment			***Percentage of Change***
Government	**13.3**	**13.9**	**12.9**	**5.9**
Table Source: BEA 2015.				

Table 3-556. 2014 Average Annual Labor Earnings by Sector, 2014		
Industries	**Average Annual Wages (2014 dollars)**	
	Socioeconomic Analysis Area	**United States**
Total	**41,097**	**51,361**
Non-Services Related	**54,530**	**60,256**
Natural Resources and Mining	32,020	59,666
Agriculture, Forestry, Fishing and Hunting	30,266	30,625
Mining (Including Fossil Fuels)	83,858	102,106
Construction	42,513	55,041
Manufacturing (Including Forest Products)	69,033	62,977
Services Related	**37,044**	**49,381**
Trade, Transportation, and Utilities	38,244	42,988
Information	47,679	90,804
Financial Activities	52,165	85,261
Professional and Business Services	42,299	66,657
Education and Health Services	41,567	45,951
Leisure and Hospitality	14,894	20,993
Other Services	25,957	33,935
Unclassified	47,404	49,448
Government	**42,346**	**51,726**
Federal Government	68,022	75,784
State Government	44,929	54,184
Local Government	35,403	46,146
Table Source: BEA 2015.		

While increases in services related employment relative to the non-service/ government sectors may have a negative effect on regional wages, jobs in service related industries may play an important role

in increasing overall labor participation. Since service related sectors generally provide greater employment opportunities for women and minority racial groups, job creation in lower paying industries may end up having a positive net effect on the social and economic well-being of surrounding communities because they provide greater employment opportunities for minority and other underserved populations (ASA 2005).

Personal Income and Poverty

Total personal income (TPI) and per capita personal income (PCPI) are two of the most relied on measure of economic standing. These indicators are a useful way to, among other things, gauge economic growth over time or compare counties and states to their counterparts. High levels of personal income within a region generally indicates greater employment opportunities, a highly skilled labor force, greater economic resiliency, and well-developed infrastructure; while low personal income can be an indicator of poor economic conditions and limited employment opportunities.

Between 2000 and 2014, TPI within the socioeconomic study area increased from $23.3 million to $29.9 million (in real terms) (BEA 2015). This growth was created by changes in three key components: employment earnings, transfer payments and investment income. As shown in Table 3-557, total labor earnings for the socioeconomic study area increased even though its share of overall TPI decreased. This further provides evidence that job growth in the service sector has placed downward pressure on average local earnings per job, and implies households are receiving a larger portion of their annual income from non-employment sources.

Table 3-557. Components of Personal Income 2000, 2014

Income	2014 U.S. Dollars		Percent of Transfer Payments	
	2000	2014	2000	2014
Labor Earnings	**16,345,741**	**18,683,768**	**70.1**	**62.4**
Non-Labor Income	**6,987,755**	**11,243,391**	**29.9**	**37.6**
Dividends, Interest, and Rent	4,343,388	5,662,299	18.6	18.9
Age-Related Transfer Payments	1,447,555	3,087,203	6.2	10.3
Hardship-Related Transfer Payments	768,077	1,710,270	3.3	5.7
Other Transfer Payments	428,694	783,619	1.8	2.6

Table Source: BEA 2015.

PCPI has continued to increase in spite of declining average wages because of increases in other forms of non-labor payments. Between 2000 and 2014, local non-labor income increased from $6.9 to $11.2 million (Table 3-557). These payments include age and economic hardship-related payments from the government (i.e., retirement and disability insurance, medical payments, welfare assistance, unemployment, veteran's benefits) as well as investment income (i.e., dividends, interest, rent).

Over the last 14 years, regional investment income increased, but continued to support approximately 19 percent of TPI in 2000 and 2014. During this time, however, transfer payments from the government to individuals more than doubled. In real terms, transfer payments to individuals within the socioeconomic study area increased from $2.6 to $5.5 million, growing from 11 percent of TPI in 2000 to 19 percent by 2014 (BEA 2015). Increased transfer payments to residents of these nine counties

over this period can be attributed to increased eligibility for age-related (retirement, disability insurance, and Medicare) and income maintenance (welfare assistance and Medicaid) programs. The region's increasing economic dependence on age and income related transfer payments suggests populations surrounding the B2H Project have become older and less financially secure over the last 14 years.

Financially insecure households are more at risk and are more vulnerable to a number of hardships that may negatively affect their health, cognitive development, emotional well-being, and school achievement, and promote socially unacceptable behavior (Battistich et al. 1995; Booth and Caan 2005; Chung 2004; Farrington 1995; Haan et al. 1987; Hopson and Lee 2011; Patterson 1991; Williams 1984). Following the Office of Management and Budget's Directive 14, the U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to detect who is poor. If the total income for a family or an individual falls below the relevant poverty threshold, then the family or an unrelated individual is classified as being "below the poverty level."

Although poverty rates for the socioeconomic study area are comparable to state and national level statistics, individual county's poverty rates vary considerable (Table 3-558). Although poverty rates for individuals and families in Ada and Gilliam counties are low compared to respective state statistics, the remaining seven counties have a higher concentration of individuals and families living below the poverty line. In Canyon, Owyhee, and Malheur counties, more than 20 percent of individuals, and 15 percent of families are considered to live in poverty. If poverty was examined at an even closer scale, statistics would likely show that there are pockets with high concentrations of people and families living in poverty within each of these counties.

Table 3-558. Poverty, 2014

Area	Percent of People Below Poverty Threshold	Percent of Families Below Poverty Threshold
Gilliam County, Oregon	11.8	5.6
Morrow County, Oregon	18	15.4
Umatilla County, Oregon	16.5	13.1
Union County, Oregon	18.6	11.9
Baker County, Oregon	18	11.7
Malheur County, Oregon	27.4	20
Canyon County, Idaho	20.4	15.5
Ada County, Idaho	13.1	9
Owyhee County, Idaho	24.2	20.9
Socioeconomic Study Area	**16.3**	**11.8**
Idaho	**15.6**	**11**
Oregon	**16.7**	**11.5**
United States	**16**	**11.2**

Table Source: U.S. Census Bureau 2013.

Table Notes:
The data in this table are calculated by American Community Survey using annual surveys conducted during 2009-2013 and are representative of average characteristics during this period.
Percent below poverty level by age and family type is calculated by dividing the number of people by demographic in poverty by the total population of that demographic.

Specialization

Highly specialized economies (i.e., those that depend on a few industries for the bulk of employment and income) are more prone to cyclical fluctuations and generally support fewer economic opportunities. Communities have been identified as being specialized with respect to employment using a ratio of local employment in each industry in a region of interest relative to the percent of employment in that industry for a larger reference area. When local employment in a given industry accounts for a larger proportion of total employment than in the broader reference region, local employment specialization exists in that industry (USFS 1998).

Applying this criterion to employment data for the B2H Project socioeconomic study area reveals that the region was slightly more specialized with respect to non-services related industries When compared to the broader U.S. economy, non-services related sectors supported a larger proportion (+3.3 percent) of local employment opportunities. Employment specialization in non-services related sectors were concentrated in industries that directly relied on the region's natural resources, natural resources and Mining (+1.8 percent) and agriculture, forestry, fishing and hunting (+1.6 percent) (BEA 2015). Specialization in these natural resource based activities is further discussed in detail below.

Agriculture

Farming and ranching continue to be an integral part of the economy, environment and way of life in Eastern Pacific Northwest. The region's rich soils, moderate rainfall, and mild winters make it one of the most ecologically rich farming areas in the U.S.; and enable it to grow a significant share of the nation's wheat, potatoes, apples and pears (USDA 2012). At the time of the most recent Census of Agriculture, there were 60,255 farms producing agricultural products on more than 28 million acres of land across Oregon and Idaho (USDA 2012). Cash receipts for agricultural products produced in these states exceeded $13.9 billion in 2014 (BEA 2014).

Agricultural production is prevalent in all six of the counties that the B2H Project would cross. Farm counts and acreage estimates for each county, as reported in the 2012 Census of Agriculture, are shown below in Table 3-559. In 2012 there were 5,169 farms producing fruit and vegetable crops, grains, forage, and livestock on more than 5.4 million acres across the six counties. Approximately 12.5 percent of which, were high-value irrigated crop and pasture lands (USDA 2012).

Table 3-559. Number of Farms and Land in Farms (Acres), 2012					
Area	**Number of Farms**	**Total Cropland[1] (Acres)**	**Irrigated Land (Acres)**	**Total Land in Farms (Acres)**	**Percent of Land Base in Farms**
Morrow County, Oregon	401	486,433	65,637	1,165,126	89.6
Umatilla County, Oregon	1,603	769,670	147,844	1,308,312	63.6
Union County, Oregon	829	119,224	49,049	411,671	31.6
Baker County, Oregon	645	107,531	100,898	710,789	36.2
Malheur County, Oregon	1,113	204,769	183,003	1,076,768	17
Owyhee County, Idaho	578	140,719	133,530	748,771	15.3
B2H Project Area	5,169	1,828,346	679,961	5,421,437	30.4

Table Source: USDA 2012.
Table Note: [1]Total cropland (both irrigated and nonirrigated land) includes five components: cropland harvested, crop failure, cultivated summer fallow, cropland used only for pasture, and idle cropland.

Agricultural production in these counties was collectively valued at $1.8 billion in 2014 (BEA 2014). The majority of cash receipts were collected on agricultural goods produced in Umatilla, Morrow, and Malheur counties – three of Oregon's top Agribusiness counties. In addition to commodity cash receipts, farm income often includes government payments and other farm-related income. Once production expenses are factored in 2014 net farm income for the six-county area shrank to $236 million (Table 3-560). The large variance between farm cash receipts and net income illustrates how profit margins for agricultural producers can be tight, especially for smaller scale operators.

Table 3-560. Farm Business Income, 2014 (thousands of 2014 dollars)					
Area	**Cash Receipts**		**Other Income**		**Net Income**
	Livestock and Products	**Crops**	**Government Payments**	**Imputed Rent and Miscellaneous Income**	
Morrow County, Oregon	504,448	133,472	13,942	29,255	107,780
Umatilla County, Oregon	71,299	305,907	14,250	87,334	20,529
Union County, Oregon	24,720	39,529	2,650	15,368	3,483
Baker County, Oregon	69,491	32,937	6,062	12,700	5,029
Malheur County, Oregon	244,275	110,596	11,094	37,248	13,263
Owyhee County, Idaho	263,103	58,889	3,762	10,809	76,066
B2H Project Area	**1,177,336**	**681,330**	**51,760**	**192,714**	**236,150**

Table Source: BEA 2014.

The farm sector supported approximately 9,700 jobs[5] and accounted for nearly 11 percent of total employment across these six counties in 2014 (BEA 2014). Approximately 48 percent of these jobs were held by self-employed proprietors who worked (full and part-time) as non-corporate farm operators. The larger share of regional farm employment was supported by hired farm laborers who may have worked full-time or part-time throughout the year. In 2014, hired farm workers within these six counties earned $32,344 on average, with workers involved in animal production making about $7,000 on average annually more than their counterparts in crop production (BLS 2015).

[5]These employment figures include sole proprietors, partners, and hired full-time and part-time farm laborers.

Much of agricultural production in the U.S. continues to come from family farms where production is highly seasonal and much of the labor is provided by unpaid family workers. Farming households often draw a significant portion of their income from off-farm sources and reallocate various family members' time to tasks on the farm throughout the year. A previous agriculture study estimated that unpaid family labor might provide nearly two-thirds of the labor inputs required by the agricultural sector (Kandel 2008). When the employment statistics discussed above are considered alongside contributions of unpaid family workers, the farm sector is revealed to play a much larger role in the rural communities that surround the proposed B2H Project.

Timber

The cool temperate climate of the Pacific Northwest creates ideal soil conditions for forested lands that produce high quality timber and forest products. Oregon has historically been divided into two major wood-producing regions, Western and Eastern. The Eastern Region is comprised of two resource areas, which encompass all counties east of the crest of Cascade Range. Percentages of forested lands within each Eastern Region county are illustrated in the figure below (Figure 3-7).

The B2H Project area is within the Blue Mountain Resource Area, which bisects the region from north to south along Morrow, Grant, and Harney counties. This resource area makes up about 21 percent of eastern Oregon and is almost 65 percent forested lands. Viable commercial timber species in the Blue Mountain area include ponderosa pine, lodgepole pine, Douglas-fir, western juniper, white or grand fir, and quaking aspen. Although the area is heavily forested, only a portion of these lands are classified as timberlands who produce, or are capable of producing, more than 20 cubic feet per acre per year of industrial wood crops under natural conditions (USDA 2004).

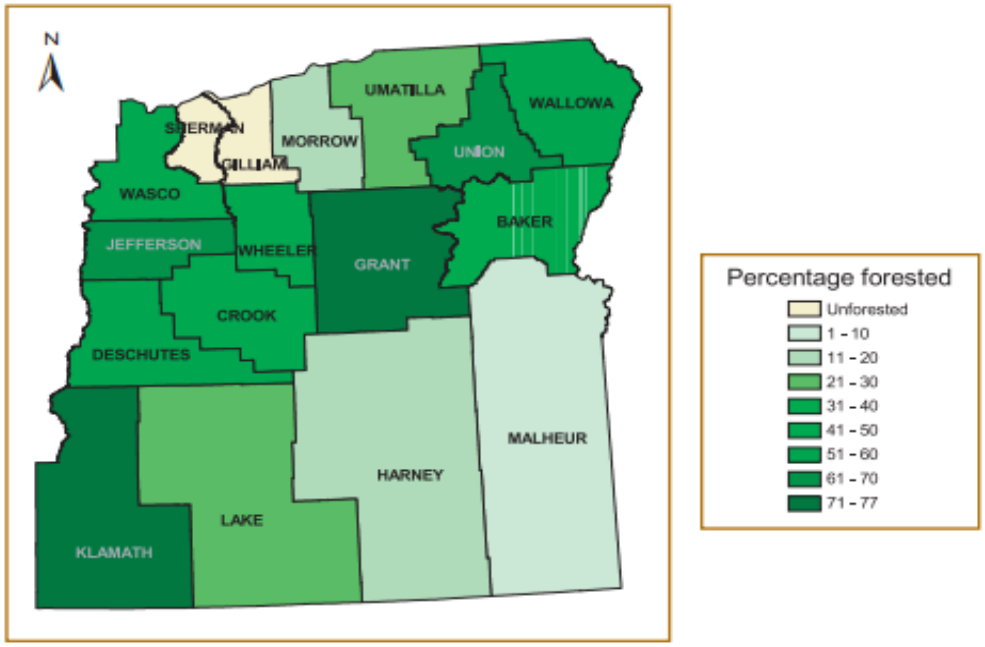


Figure Source: USDA 2004.

Figure 3-7. Percent of Forested in Eastern Oregon Land by County

Firms in the forestry and logging subsector grow and harvest timber on a long production cycle, generally 10 years or more. Since timber production requires natural forests or suitably large areas of land that are available long term, regional timber harvests occur on a combination of federal and state public lands, tribal lands, and private lands managed for timber. Between 2003 and 2009, timber harvests in the B2H Project area accounted for 2.4 percent to 3.2 percent of annual state harvests during these years. Like other regions in the Pacific Northwest, timber harvests in the Blue Mountain region have been declining. In 2005, annual harvests within the B2H Project's socioeconomic study area totaled 136 million board-feet. By 2009 total harvests in counties crossed by the proposed line had fallen to 88 million board-feet, with annual harvest falling to 67 million board-feet by 2014. Total timber harvests for counties crossed by the B2H Project are reported below in thousands of board-feet (Table 3-561).

Table 3-561. Timber Harvest (thousand board-feet) in B2H Analysis Area, 2014

Area	Private Land Harvest	Public Land Harvest	Total Volume of Harvest
Morrow County, Oregon	1,258	2,523	3,781
Umatilla County, Oregon	14,970	199	15,169
Union County, Oregon	33,186	6,211	39,397
Baker County, Oregon	4,856	4,282	9,138
Malheur County, Oregon	48	0	48

Table Source: Oregon Department of Forestry 2015.

Table Note: There was no recorded timber harvest in Gilliam and Malheur counties or in Owyhee, Idaho in 2009 or 2014.

The growing, harvesting, and processing of timber has long been an economic cornerstone in rural Oregon. These activities directly support local employment opportunities in three major categories: growing and harvesting[6], sawmills and paper mills[7], and wood products manufacturing[8]. In addition to the jobs directly supported in these timber-related industries, local timber production induces and indirectly supports employment opportunities in a wide range of non-timber-related sectors.

Over the years, timber-related employment within the six-county B2H Project area have steadily declined as a result of slowing in local timber harvesting and processing. Between 1998 and 2013, timber-related employment across these counties shrank by 37 percent from 2,382 to 1,498 jobs (U.S. Census Bureau 2015). Timber-related jobs within the B2H Project area are primarily supported by mills and wood product manufacturing facilities, which pay $46,783 and $43,741 annually on average (BLS 2015). These jobs are particularly critical in rural communities where wood product manufacturing accounts for the majority of manufacturing jobs and generally pay higher average wages than those in other sectors.

Outdoor Recreation and Tourism

Outdoor recreation and tourism in the study area brings visitors to the area for a variety of reasons. These visitors generate economic activity through expenditures on such things as retail, food and

[6] *[NAICS codes: forestry and logging (113), support activities for forestry (1153)]*

[7] *[NAICS codes: sawmills and wood preservation (3211), pulp, paper, and paperboard mills (3221), veneer, plywood, and engineered wood product manufacturing (3212)]*

[8] *[NAICS codes: other wood product manufacturing (3219) and converted paper product manufacturing (3222)]*

beverage and accommodations. Opportunities for various outdoor recreation, cultural and historic sites, wildlife viewing and scenic drives are all important to this economic activity. Recreation and tourism is not classified or measured as a standard industrial category; therefore, employment and income data are not specifically collected for this sector. Components of recreation and tourism activities are instead captured in a number of industrial sectors, primarily the retail sales and services sectors. Estimates of travel-related spending and associated employment in Oregon for 2014 prepared for the Oregon Tourism Commission found that statewide travel-related employment accounted for about 8.8 percent of total employment (Table 3-562).

Table 3-562. Travel-Related Economic Contributions in Oregon Counties, 2014

Area	Travel Spending[1]	Travel-Related Earnings[1]	Travel-Related Employment	Percent of Total Employment[2]
Gilliam	9	2.2	100	2.9
Morrow	14.5	3.4	180	2.5
Umatilla	147.9	45.1	2,310	5.8
Union	33.1	10.4	560	3.9
Baker	43.7	12.2	710	8.5
Malheur	40.3	11	570	3.4
Oregon	10,300.0	4,800.0	153,700.0	8.8

Table Source: Dean Runyan Associates 2015.

Table Notes:

[1]Dollars in Millions

[2]Travel-related employment is estimated as a percent of total employment using data from the U.S. Bureau of Economic Analysis.

In Umatilla and Baker counties, travel-related employment accounted for a smaller share of total employment than the statewide average (5.8 percent and 8.5 percent respectively). Travel-related employment in the socioeconomic study area's other four Oregon counties averaged 2.5 percent of local employment. These estimates are primarily based on travel-related spending on accommodation, food and beverages, local transportation, recreation and entertainment, and shopping. While these estimates include business travel and recreation and tourism-related travel, they provide a useful indication of the relative importance of recreation and tourism to the local economies within the socioeconomic study area.

The most recent comprehensive assessment of travel-related spending and associated employment in Idaho counties was prepared in 2004 (Global Insight and D.K. Shifflet & Associates [Global Insight] 2005). This analysis found that statewide travel-related employment accounted for about 7 percent of total employment (Table 3-563). Travel-related employment accounted for a larger share of total employment than the statewide average in Ada County (9 percent versus 7 percent) and a smaller share than the state average in Canyon and Owyhee counties (4 percent and 1 percent, respectively).

Table 3-563. Travel-Related Economic Contributions by Idaho County, 2004				
Area	**Travel Spending[1]**	**Travel-Related Earnings[1]**	**Travel-Related Employment**	**Percent of Total Employment**
Ada	1,128.90	277	17,951	9
Canyon	126.9	31.1	2,017	4
Owyhee	1.8	0.4	28	1
Idaho	2,968.10	728.3	47,203	7
Table Source: Global Insight 2005. *Table Note*: [1]Dollars in Millions				

Estimates of statewide travel-related impacts prepared by the U.S. Travel Association (2009), however, suggest that the 2004 estimates prepared by Global Insight may overestimate the importance of travel-related employment in Idaho, at least at the state level. The U.S. Travel Association (2009) estimates found that travel-related employment accounted for 23,700 jobs in Idaho in 2004, about half the number estimated by Global Insight. The 2005 Global Insight estimates do, however, represent the best available data at the county level and provide an indication of the relative importance of recreation and tourism in the three socioeconomic study area counties in Idaho.

Designated recreation areas within 0.5 mile of the proposed B2H Project and alternatives are discussed in Section 3.2.8. These areas include the BLM- managed Virtue Flat Extensive Recreation Management Area (ERMA), the Owyhee River below the Dam SRMA, the Oregon Trail and Owyhee River ACECs. Section 3.2.8 also discusses dispersed recreation activities, including hunting, OHV use, and camping that may occur within the analysis area.

Tribal Households

The U.S. Constitution (Article II, Section 2, Clause 2) provides that treaties are equal to federal laws and are binding on states as the supreme law of the land. As a portion of the B2H Project area passes through lands ceded to the U.S. Government by 1855 treaty with the CTUIR, the BLM—as manager of these federal lands—has the legal responsibility to consult with the CTUIR and consider the conditions necessary to satisfy the rights reserved by the tribe as part of its treaty. Exercise of treaty rights could include, but is not limited to, water rights, taking fish, mineral rights, collection of plant resources such as roots and berries, and hunting of small and large game for economic, religious, and cultural use. Treaty rights also include pasturing stock on open and unclaimed lands.

Although the CTUIR is the only tribe with ceded lands in the B2H Project area, several other tribes consider portions of, or the entirety of, the B2H Project area as part of their aboriginal territory, subsistence range, traditional use area, or zone of influence. These tribes include the Shoshone-Paiute of the Duck Valley Indian Reservation, the Burns Paiute, the Confederated Tribes of the Warm Springs Indian Reservation, the Fort McDermitt Paiute and Shoshone Tribes, the Nez Perce, the Confederated Tribes of the Colville Reservation, the Yakama Nation, and the Shoshone-Bannock of the Fort Hall Reservation.

While each of these tribes has a unique history and heritage, they share land-based worldviews rooted in the active recognition of kinship with the natural world. Thus, the social, economic, and

spiritual structures and practices of tribal households are centered on sustaining a stable relationship with their native lands. Subsistence activities are an integral part of their customary and traditional lifestyles. These activities include hunting, fishing, gathering, trapping, and "other activities which provide income in kind—food, heat, clothing, shelter, and a variety of other subsistence goods and services" consumed by and shared within the family and community (Kuokkanen 2011).

In addition to providing household sustenance, many tribal families barter, trade, or sell subsistence goods and services for fuel, transportation, food, shelter, clothing, and cultural utilitarian items. While there is no data available to estimate the percent contribution which fishing, hunting and gathering of wild plants provides to households or communities of the abovementioned tribes, these activities are vital to sustaining viable communities in a manner that promotes cohesiveness, pride and sharing (Inuit Circumpolar Conference 1992).

Refer to Sections 3.2.3, 3.2.4, 3.2.6, 3.2.13, and 3.2.14 for further discussion of treaty rights from the perspective of vegetation, wildlife, land use, and cultural resources, respectively.

Housing and Lodging

This section will provide information on housing and lodging potentially available to the construction workforce in the study area and in the towns and areas close to the transmission route. This information will include data related to vacant and occupied housing units and temporary lodging options available in the study area.

Housing Characteristics

Housing estimates are presented in Table 3-564 for the socioeconomic study area and for Oregon and Idaho. These estimates suggest that limited housing is available for rent in Gilliam, Morrow, and Owyhee counties, with estimates of less than 1,000 available units in each county. An estimated 718 units are available for rent in Umatilla County, Oregon, and an estimated 4,038 units and 1,840 units are available in Ada and Canyon counties, Idaho, respectively.

Table 3-564. B2H Project Area Housing Availability

Housing Characteristics	States		Counties					
			Idaho	Oregon				
	Idaho	Oregon	Owyhee	Morrow	Umatilla	Union	Baker	Malheur
Total Housing Units	667,796	1,675,562	4,781	4,426	29,638	11,464	8,806	11,637
Occupied	579,408	1,518,938	4,076	3,741	26,744	10,235	7,120	10,136
Vacant	88,388	156,624	705	685	2,894	1,229	1,686	1,501
For rent	16,360	40,193	104	70	718	283	181	297
Rented or sold, not occupied	997	2,608	8	4	46	20	20	31
For sale only	12,814	24,191	72	55	289	124	147	139

Table 3-564. B2H Project Area Housing Availability								
Housing Characteristics	States		Counties					
			Idaho	Oregon				
	Idaho	Oregon	Owyhee	Morrow	Umatilla	Union	Baker	Malheur
For seasonal, recreational or occasional use	2,177	4,401	22	242	888	281	48	48
All other vacancies	41,660	55,473	307	145	767	248	1,058	463
Owner-Occupied Housing Units	404,903	29,758	2,856	2,799	16,916	6,873	332	6,501
Renter-Occupied Housing Units	174,505	944,485	1,220	1,117	9,988	3,628	7,040	3,910
Rental Vacancy Rate	8.50%	6.50%	7.80%	5.90%	6.70%	7.20%	7.40%	7%
Median Gross Rent (2009-2013 ACS Estimate)	$607	$749	$409	$514	$530	$532	$491	$467
Median Value of Owner-Occupied Housing (2009-2013 ACS Estimate)	$162,100	$121,200	$238,000	$119,800	$142,700	$156,600	$147,700	$132,600

Table Source: U.S. Census Bureau 2012a, 2013.

Table Notes: Median and gross rent based on U.S. Census Bureau 2009-2013 5-year average estimates from the ACS (U.S. Census Bureau 2013). Other housing characteristics based on 2010 U.S. Census data (U.S. Census Bureau 2012a)
ACS = American Community Survey

The availability of temporary housing varies seasonally and geographically within the B2H Project area. Demand for temporary housing is generally greatest during the tourism season in the summer months. Statewide in Oregon, the average hotel and motel occupancy rate in 2009 was 63.2 percent in June compared to 38.3 percent in December, with an annual average rate of 53.9 percent (TravelOregon.com 2009a, 2009b). Hotel and motel occupancy rates also vary by region.

Recreational Vehicle Parks

Comprehensive data are not available on recreational vehicle (RV) parks in the B2H Project vicinity. Table 3-565 presents data for RV parks in the socioeconomic study area by county. These data were compiled from travel web sites, primarily TravelOregon.com, VisitIdaho.org, and Rvparking.com, but do not necessarily account for all of the RV parks near the B2H Project. Approximate numbers of spaces are provided. These represent the total approximate number of spaces available at the identified RV parks in each community, not the number that would necessarily be available to rent.

Table 3-565. RV Parks		
Area	Number of RV Parks[1]	Estimated Number of RV Spaces[2]
Gilliam County, Oregon	3	73
Morrow County, Oregon	2	166
Umatilla County, Oregon	15	754
Union County, Oregon	9	432

Table 3-565. RV Parks		
Area	**Number of RV Parks[1]**	**Estimated Number of RV Spaces[2]**
Baker County, Oregon	5	219
Malheur County, Oregon	5	199
Canyon County, Idaho	5	440
Ada County, Idaho	6	548
Owyhee County, Idaho	4	134

Table Source: Rvparking.com n.d.; TravelOregon.com n.d.; VisitIdaho.org n.d.

Table Notes:

[1]These data were compiled from travel web sites and do not necessarily account for all RV parks near the B2H Project.

[2]These estimates represent the total number of spaces available at the identified RV parks in each community, not the number that will necessarily be available to rent.

Hotels and Motels

Hotel and motel accommodations for each county are listed in Table 3-566. These data do not necessarily account for all of the existing hotel, motel, and bed and breakfast rooms within 20 miles of the proposed B2H Project because the Smith Travel Research data does not include establishments with less than 15 rooms. The data compiled on the state tourism web sites, which includes hotels, motels, and bed and breakfast inns with less than 15 rooms, are for participating businesses only. The hotel and motel data summarized in Table 3-566, however, represents a reasonable approximation of the number of hotel and motel rooms based on the best available data.

Table 3-566. Hotels and Motels by County			
Area	**Number of Hotels[1]**	**Number of Rooms**	**Estimated Number of Available Rooms[2]**
Gilliam County, Oregon	24	1,639	603
Morrow County, Oregon	84	6,915	2,545
Umatilla County, Oregon	22	1,054	388
Union County, Oregon	2	13	5
Baker County, Oregon	3	140	52
Malheur County, Oregon	10	427	157
Canyon County, Idaho	5	110	40
Ada County, Idaho	10	443	163
Owyhee County, Idaho	12	793	292

Table Source: Smith Travel Research 2009, 2011; TravelOregon.com 2009a, n.d.; Visit Idaho.org n.d.

Table Notes:

[1]Data were compiled by Smith Travel Research and include hotels, motels, and bed and breakfasts with 15 or more rooms.

[2]Average number of rooms is estimated based on the average hotel occupancy rate in Oregon in June 2009.

Tax Revenues

Oregon

Property taxes are an important source of revenue for the public sector in Oregon (Oregon Department of Revenue 2015) and are based on the assessed value of the property. In Oregon, the appropriate county assessor administers most property assessments, but the Oregon Department of Revenue assesses the value of some properties, including public utilities and large industrial properties.

Property taxes imposed for fiscal year 2014/2015 are presented for Oregon and the B2H Project area counties in Oregon in Table 3-567. This table also presents the total assessed value of property in each county, and their average tax rates. Total property taxes imposed ranged from approximately $8.9 million in Gilliam County to about $77.0 million in Umatilla County.

Table 3-567. Property Tax Revenue in Oregon Counties, FY 2014-2015

Area	Total Assessed Value ($1,000)	Average Tax Rate (per $1,000 of Assessed Value)	Net Property Tax Imposed ($1,000)
Gilliam County, Oregon	753,455	11.91	8,974
Morrow County, Oregon	1,774,504	15.53	27,559
Umatilla County, Oregon	4,958,881	15.71	77,889
Union County, Oregon	1,655,564	12.51	20,716
Baker County, Oregon	1,330,221	13.05	17,358
Malheur County, Oregon	1,752,017	13.59	23,802
Oregon	**343,171,244**	**16.15**	**5,540,756**

Table Source: Oregon Department of Revenue 2015

Oregon does not have sales tax but does impose a statewide transient lodging tax of one percent. The majority of the revenue generated from this tax (80 percent) is used to fund state tourism marketing programs, with up to 15 percent used to implement regional tourism marketing programs. Lodging tax revenues generated in the northeastern region of Oregon, which includes the counties in the B2H Project area, approached $450,000 during 2015 (Oregon Department of Revenue 2016).

Idaho

Property taxes in Idaho are based on a property's current market value, and most homes, farms, and businesses are subject to property tax. Property tax values for operating property, including industries engaged in electric generation, transmission, and distribution, are set by the Idaho State Tax Commission. The Idaho State Tax Commission appraises operating property using a unit-appraisal approach, which values a group of property items as one entity. The market value of each unit is estimated using cost, income, and/or market approaches to valuation (Idaho State Tax Commission 2003). Property taxes are collected only by local taxing jurisdictions in Idaho and are not collected by the state (Idaho State Tax Commission 2010). Property tax revenues for 2011 are summarized for Idaho counties in the broader analysis area in Table 3-568. Total property taxes imposed ranged from $402 million in Owyhee County to $23 billion in Ada County.

Table 3-568. Property Tax Revenues in Idaho Counties, Fiscal Year 2011				
Area	Real and Personal Property Assessed Value ($1,000)[1]	Operating Property Assessed Value ($1,000)[1,2]	Total Assessed Value ($1,000)	2011 Property Tax Revenue ($1,000)[3]
Ada	23,814,462	692,004	24,566,467	391,693
Canyon	6,614,288	214,417	6,840,706	138,820
Owyhee	402,933	103,140	507,439	5,001
Idaho	101,365,623	4,822,889	106,659,746	1,380,558

Table Source: Idaho State Tax Commission 2012a.

Table Notes:

[1]Real and personal property includes residential, industrial, and commercial property and farms, timber, and mining.

[2]Operating property includes industries engaged in electric generation, transmission, and distribution.

[3]Property tax rates vary by and within each county. The total property tax revenues shown here are for all taxing districts within each county, including towns, cities, and special taxing districts

The sales and use tax rate in Idaho is 6 percent. Sales tax is levied on goods and services purchased within the state. Use tax is imposed on goods purchased tax-free outside Idaho for consumption, use, or storage in Idaho. Use tax is paid directly to the state rather than to the seller of the good. The state also applies a travel and convention tax of 2 percent on hotel/motel occupants and campground users (Idaho State Tax Commission 2012b). Long-term, temporary residents (more than 30 days) are exempt from the travel and convention tax. Sales, use, and travel and convention tax revenues are summarized for fiscal year 2011 by affected Idaho counties in Table 3-569. Total revenues ranged from about $1.5 million in Owyhee County to $258.9 million in Ada County.

Table 3-569. Sales, Use, and Travel and Convention Tax Revenues in Idaho Counties, Fiscal Year 2011 ($1,000)			
Area	Sales and Use Tax ($1,000)	Travel and Convention Tax ($1,000)	Total ($1,000)
Ada	258,909.90	1,805.49	260,715.30
Canyon	41,564.50	211.82	41,776.30
Owyhee	1,568.20	2.55	1,570.80

Table Source: Idaho State Tax Commission 2012b.

Individual income tax generated $1.45 billion in revenues in Idaho in fiscal year 2011 (Idaho State Tax Commission 2012c). Data on income tax revenues by county are not readily available for Idaho (Pack 2012). The corporate tax rate in Idaho is 7.6 percent. Corporate income tax generated $22.6 million in revenues in Idaho in fiscal year 2011 (Idaho State Tax Commission 2012c).

Community Services

Local governments and other entities provide public services, such as solid-waste disposal, law enforcement, fire protection, health care, and education to communities surrounding the B2H Project area. Interviews were conducted with local authorities in each county to assess the availability of public services and infrastructure in the six counties that would be crossed by the proposed Project and alternatives. These interviews had two purposes: (1) identify the current capacities of different

organizations to provide services, and (2) identify the ability of these service providers to meet the potential increase in demand associated with the proposed B2H Project.

Solid-Waste Management

Solid waste generated during construction would likely be disposed of at landfills located within the B2H Project area. Landfills located within the B2H Project area include those located in Morrow, Baker, and Malheur counties in Oregon and in Canyon County, Idaho. These landfills are listed in Table 3-570, which also identifies the volume of waste each landfill currently receives (tons per day), as well as the amount of waste each landfill is permitted to receive (tons per day), where this information is available.

Table 3-570. Landfills within the Analysis Area

Facility Name	County	Current Volume of Waste (Tons Received/Day)	Current Permitted Volume of Waste (Tons Received/Day)
Finley Buttes Landfill	Morrow, Oregon	1,923 tons	No permitting restriction
Clay Peak Landfill	Payette, Idaho	approximately 500 tons	No permitting restriction
Baker Sanitary Landfill	Baker, Oregon	50 to 60 tons	No permitting restriction
Lytle Boulevard Landfill	Malheur, Oregon	18,000-19,000 tons	20,000 tons
Pickles Butte Landfill	Canyon, Idaho	Unknown[1]	Unknown[1]

Table Source: Freese 2011; Geedes 2011; Large 2011; Schmidt 2016; Geedes 216

Table Note: [1]Multiple attempts were made to contact Pickles Butte Landfill to obtain information about current and future operations. No response has been received to date.

Law Enforcement

The proposed B2H Project and alternatives would cross through the jurisdiction of six county sheriff's departments (Table 3-571). Four of these sheriff's departments responded to requests for information (Bentz 2011; Diehl 2011; Hoagland 2011; Southwick 2011).

Table 3-571. Law Enforcement

Department	Number of Law Enforcement Personal	Response Time to Project
Morrow County Sheriff	Unknown[1]	Unknown[1]
Umatilla County Sheriff	7 deputies (3 within the B2H Project area)	20 minutes to next day
Union County Sheriff	Unknown[1]	Unknown[1]
Baker County Sheriff	8 deputies	5 minutes to 1 hour
Malheur County Sheriff	18 deputies	1 hour
Owyhee County Sheriff	13 deputies	20 minutes

Table Source: Bentz 2011; Diehl 2011; Hoagland 2011; Southwick 2011.

Table Note: [1]The Morrow County and Union County Sheriff's offices did not respond to several requests for information Fire Protection and Emergency Response.

Response times from local stations to the B2H Project area would vary and depend on the time of day, the priority of the emergency, environmental conditions, the location of the emergency, and whether law enforcement personnel were already patrolling the area. Estimated response times would range from 5 minutes to 1 hour for the Baker, Malheur, and Owyhee County sheriffs' departments (Bentz 2011; Hoagland 2011; Southwick 2011). The Umatilla County Sheriff's Department indicated that response

times for non-emergency calls during the day could take several hours and that non-emergency calls at night would not likely be responded to until the next day. Response times for emergency calls (i.e., life-threatening situations) by the Umatilla County Sheriff's Department would likely range from 20 minutes to 1 hour (Diehl 2011).

The B2H Project and proposed alternatives would cross through the jurisdiction of 13 fire departments (Table 3-572). These departments were initially identified by contacting offices with jurisdiction over the counties crossed by the proposed B2H Project. In addition, the Oregon State Fire Marshal's office was contacted to confirm that the departments shown in Table 3-572 covered the entire B2H Project area (Warner 2011). Each fire department was contacted and 10 of the 13 fire departments and 1 federal fire office responded to requests for information (Carter 2011; Enright 2011; Harper 2011; Johnson 2011; Martin 2011; Morgan 2011; Payton 2011; Rogelstad 2011; Skerjanec 2011; Webb 2011; Wooldridge 2011).

Table 3-572. Fire Departments

Department	County	Number of Fire	Equipment	Response Time
Boardman Rural Fire Protection District	Morrow	7 paid	(3) type 1 interface engines (off-road)	0.5 hour south-route
		17 volunteers	(1) type 1 tender with a 3,000-gallon tank	10 minutes north-route
			(1) type 6 engine	
Ione Rural Fire Protection District	Morrow	14 to 15 volunteers	(2) pumper engines (2,000- and 1,000-gallon tanks)	Unknown[1]
			(3) brush trucks	
			(1) tender with a 3,000-gallon tank	
Echo Rural Fire Department	Umatilla	20 to 21 volunteers	(5) brush rigs	20–25 minutes near
			(3) tankers	Pilot Rock
			(4) pumpers	40 minutes in other areas
Pilot Rock Rural Fire Protection District	Umatilla	Unknown[1]	Unknown[1]	Unknown[1]
North Powder Fire Department	Union	16 volunteers	(1) type 6 brush rig	12 to 15 minutes
			(1) 2,500 gallon tender (1) 1,800 gallon tender (1) 1,500 gallon tender	
La Grande Rural Fire Protection District	Union	1 paid	(3) type 1 engines	10 minutes
		20 volunteers	(1) brush truck	
			(1) 3,000-gallon water tender	
			(2) rescue vehicles	
Union Emergency Services – Fire Department	Union	15 volunteers	(2) ambulances (1) rescue rig (4) fire engines (2) tankers	11 to 12 minutes
			(1) brush truck	
Wallowa-Whitman National Forest – Blue	Union	64 seasonal personnel	(11) wildland engines	Varies with distance
			(1) type 2 helicopter (July –	

Table 3-572. Fire Departments

Department	County	Number of Fire	Equipment	Response Time
Mountain Interagency Dispatch Center: Grande Ronde Fire Zone, Burnt Powder Fire Zone, and North Fork John Day Ranger District			September) (2) single engine air tanker (July – September)	
Wallowa-Whitman National Forest	Union	11 permanent; 5 permanent seasonal; 25 temporary personnel	(4) engines (1) hand crews	20 minutes minimum; varies with distance
Keating Rural Fire District	Baker	15 volunteers	(2) structure engines (1) tender (4) wildland engines	25 minutes
Diamond Rural Fire Protection District	Baker	Unknown[1]	Unknown[1]	Unknown[1]
Baker Rural Fire Protection District	Baker	18 volunteers	(3) structure trucks (2) 4,200-gallon tenders (4) brush trucks	8 to 14 minutes
BLM Vale District Fire, Oregon	Malheur	34 permanent seasonal personnel	(11) heavy engines (8) light engines (1) tactical tender (1) dozer	Varies with distance
		60 temporary personnel	(1) single engine air tanker (July – September) (1) type 2 helicopter (July – September)	
Adrian Rural Fire Protection District	Malheur	14 volunteers	(1) 1,000-gallon pumper engine (1) 3,000-gallon tender truck (1) heavy truck with an 800-gallon tank (1) light truck with a 300-gallon tank	20 to 25 minutes
Homedale Fire Department	Owyhee	Unknown[1]	Unknown[1]	Unknown[1]
Marsing Rural Fire Department	Owyhee	32 volunteers	(2) engines (2) brush trucks (4) tenders	15 minutes
BLM Fire Management Officer	Project Wide	Not applicable	Not applicable	Not applicable

Table Sources: Carter 2011; Enright 2011; Harper 2011; Johnson 2011; Martin 2011; Morgan 2011; Payton 2011; Rogelstad 2011; Skerjanec 2011; Webb 2011; Wooldridge 2011.

Not all lands where the B2H Project would be developed fall within a designated fire district. In these cases, the closest or best-situated fire district would likely respond (Enright 2011; Wooldridge 2011).

Mutual-aid agreements have been established between local fire districts for mutual response to ensure cooperation. (Martin 2011; Payton 2011; Webb 2011). Because of these mutual-aid agreements, the fire district that responds to fires may not be the district the fire occurs in or even the closest district, but rather the district best situated and suited to respond.

Response times to a fire along the B2H Project would vary. Most of the fire districts in the B2H Project area are comprised of volunteers and, in some cases, it could take time to collect and mobilize an entire fire crew. In addition, most of the B2H Project crosses open remote lands where access is often limited. Were a fire to occur in one of these areas, it might not be immediately identified.

Health Care

A number of medical facilities serve the communities and outlying areas near the B2H Project. If minor B2H Project-related injuries occurred, they would be treated at local medical facilities or emergency rooms. Workers suffering more serious injuries would be taken to one of the major hospitals near the B2H Project. Four major hospitals capable of treating serious injuries are located within the counties of the proposed B2H Project: Saint Anthony Hospital in Pendleton, Oregon, Grande Ronde Hospital in La Grande, Oregon, Saint Alphonsus Medical Center in Ontario, Oregon and another Saint Alphonsus level four hospital in Baker City with life flight services.

Saint Anthony Hospital is a level three hospital licensed for 49 beds, 5 of which are intensive-care beds. The hospital employs about 80 nurses, and 30 physicians have staffing privileges. Medical transportation is provided by Life Flight. A Life Flight helicopter is stationed at the hospital, and the hospital has access to a fixed-wing craft. Flight times between the hospital and the B2H Project area would take about 15 minutes for the portions of the B2H Project located near Pilot Rock and 40 minutes for the areas located further east. Patients suffering major injuries, such as severed limbs or electrical burns, would be stabilized at Saint Anthony Hospital and then transported to a regional hospital for treatment (Blanc 2011).

Grande Ronde Hospital is a level four hospital licensed for 25 beds, six of which are intensive-care beds. The hospital employs about 175 nurses, and 45 physicians have staffing privileges. The Grande Ronde Hospital partners with Life Flight Network to provide emergency air medical transportation. Life Flight has both a rotor-wing helicopter and fixed-wing aircraft based in La Grande, Oregon (Grande Ronde Hospital and Clinics 2011). Flight times between the airport and the B2H Project area would likely be about 20 to 90 minutes. Patients suffering major injuries, such as severed limbs or electrical burns, would be stabilized at Grande Ronde Hospital and then transported to a regional hospital for treatment (McCowan 2011).

The Saint Alphonsus Medical Centers in Baker City and Ontario are small acute care facilities with a combined total of 74 beds. These medical centers are part of the Saint Alphonsus Health System, a four-hospital regional, faith-based Catholic ministry with over 4,300 associates and 950+ medical staff serving 700,000 people in eastern Oregon and western Idaho. Saint Alphonsus Health System is anchored by the only Level II Trauma Center in the region, Saint Alphonsus Regional Medical Center in Boise, Idaho. The Life Flight Network, which is partially owned by the Saint Alphonsus Health System,

provides Saint Alphonsus Regional Medical Center's emergency air transportation. Life Flight has rotor-wing helicopters stationed in Ontario, Oregon, and Boise, Idaho, and a fixed-wing aircraft are stationed at the Boise International Airport; flight times between the hospital and the B2H Project area will likely be about 15 minutes. This medical facility will be able to treat any injury that could occur during construction or operation of the B2H Project, with the exception of major burns; patients suffering major burns will be stabilized at this center and then sent to a burn center in Salt Lake City, Utah, or Portland, Oregon (Ryan 2012).

Public Schools

The B2H Project area crosses six counties and multiple school districts. The school districts most likely to be affected are identified by county in Table 3-573, which also identifies current student enrollment and student/teacher ratios, as well as enrollment trends for the 10 school districts that responded to requests for information. All 10 of these districts indicated that enrollment has either been flat or declining in recent years, with current trends expected to continue in the future. Student/teacher ratios for the 2010/2011 school year ranged from 7.2 students per teacher in the Huntington School District and 16 to 21 students per teacher in the La Grande School District 001.

Table 3-573. School Districts

Area	School District	Student Enrollment (2010 to 2011)	Student/Teacher Ratio (2010 to 2011)	Enrollment Trends
Oregon				
Baker	Baker School District	2,000	19.6	flat to declining
Baker	Huntington School District 16J	71	7.2	declining
Malheur	Ontario School District 8C	2,400	18.0	flat
Malheur	Vale School District 084	878	16.0	declining
Malheur	Nyssa School District 026[1]	1,130	17.0	unknown
Malheur	Adrian School District 061	242	13.6	flat
Morrow	Morrow School District 001	2,200	16.8	flat
Umatilla	Pilot Rock School District 002	352	14.6	declining
Union	La Grande School District 001	2,204	21.0	declining
Union	Union School District 005	370	16.1	declining
Idaho				
Owyhee	Marsing Joint School District 363	850	12.6	flat
Owyhee	Melba Joint School District 136	740	17.3	flat

Table Sources: Allison 2011; Burrows 2011; Hogg 2011; Lowry 2011; Milburn 2011; Nunn 2011; Panike 2011; Stalk 2011; Wegener 2011; Wood 2011.

Nonmarket Values

People derive a wide variety of benefits from lands surrounding the proposed transmission line. Some benefits are reflected in market goods such as timber, livestock, and agricultural crops; while other benefits are derived from the recreation, wildlife and fisheries, water supply and quality, and biodiversity these lands support. Benefits derived from natural amenities are commonly referred to as nonmarket

values, and have been credited with increasing the attractiveness of communities across the West (Clark and Hunter 1992; Knapp and Graves 1989; Lewis et al. 2002; McGranahan 1999; Mueser and Graves 1995; Treyz et al. 1993).

Nonmarket values can generally be classified into two categories, those derived from the direct use of natural resources and those from non-use. Nonmarket use values are realized from the consumptive and non-consumptive use of natural resources. Although the use of nonmarket goods may require consumption of associated market goods (e.g., food, gas and lodging), the personal enjoyment and satisfaction people derive from these goods exceed any monetary costs they incur to use them. These personal benefits may be attained from recreational experiences; or associated with aesthetic enjoyment, artistic and spiritual inspiration, and emotional comfort derived from natural settings.

Natural resources possess additional values beyond those associated with their current use. These passive use values include existence, option and bequest values. Existence values are the amount society is willing to pay to guarantee that an asset simply exists. In addition to implicit existence values, society's willingness to pay to preserve resources for future use attaches additional passive use values. The potential benefits people would receive from future visits to undeveloped lands along the proposed transmission line are referred to as option values when future use is expected to occur within the same generation, and bequest values when preservation allows future generations to benefit from the resource use. Along the proposed transmission line bequest and option values might exist for numerous native plant and animal species, wild and scenic landscapes, and recreational areas.

Although lands proposed for development may possess nonmarket values, use and non-use nonmarket values are difficult to quantify and assign monetary values to. Methods for measuring these values can be controversial and difficult to apply. Recently the BLM and USFS have been exploring the concept of ecosystem services as a way to describe the benefits provided by forests and other public lands, however, this type of approach has not been applied operationally in a management context (Kline 2006). While it is not feasible to estimate nonmarket values during this phase in planning process, it is important that responsible officers recognize that the true value of natural resources include both market and nonmarket values so that they can make more informed land management decisions.

The effects of the action alternatives on these types of services are assessed in the sections of this EIS that address wildlife, fish, vegetation, water resources, cultural resources, and visual resources, among others. Monetary values are not assigned to these services, but this does not lessen their importance in the decision- making process. Decision-makers will consider the economic values presented in this section within the context of the information presented elsewhere in this document, much of which cannot readily be translated into economic terms

ENVIRONMENTAL JUSTICE

Federal environmental justice regulations were established due to concerns that land uses and facilities were being placed in minority and low-income communities without regard to the consequences of these actions. Environmental justice refers to the social equity in sharing the benefits and the burdens of specific projects and/or programs and is addressed by Executive Order 12898, *Federal Actions to*

Address Environmental Justice in Minority Populations and Low-Income Populations issued in 1994 by President Clinton (Executive Order 12898, 1994). The Executive Order was signed by President Clinton on February 11, 1994; it directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. The Executive Order is in response to Title VI of the Civil Rights Act of 1964 which states "No person in the U.S. shall, in the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."

An environmental justice assessment requires an analysis of whether minority and low-income populations (i.e., populations of concern) would be affected by a proposed federal action and whether they would experience adverse impacts from the Proposed Action. If there are negative impacts, the severity and proportion of these impacts on populations of concern must be assessed in comparison to the larger majority population or populations not classified as low-income or minority. At issue is whether such negative impacts fall disproportionately on minority and/or low-income members of the community and, if so, whether they meet the threshold of disproportionately high and adverse. If disproportionately high and adverse effects are evident, EPA guidance advises consideration of alternatives and mitigation actions in coordination with extensive community outreach efforts (EPA 1998).

The EPA defines a community with potential environmental justice populations as one that has a greater percentage of minority or low-income populations than does an identified reference community. Minority populations are those populations having (1) 50 percent minority population in the affected area or (2) a significantly greater minority population than the reference area (EPA 2016). The EPA has not specified any percentage of the population that can be characterized as "significant" to define environmental justice populations. Therefore, for the purposes of this analysis, a conservative approach is used to identify potential environmental justice populations. It is assumed that if the affected area minority and/or poverty status populations are more than 10 percentage points higher than those of the reference area, there is likely an environmental justice population of concern.

For this analysis, minority includes all racial groups other than white, not Hispanic or Latino. For the year 2010, low-income populations were defined as those individuals that are considered living below poverty levels. The U.S. Census Bureau defines poverty level thresholds for individuals and a family of four as income levels below $11,139 and $22,314, respectively (U.S. Census Bureau 2012b).

To identify the presence of potential environmental justice populations residing in proximity to the B2H Project alternative segments, it is necessary to create an affected area for a smaller geographic area than that of the defined socioeconomic study area. Populations are analyzed at the 2010 U.S. Census Block and Census Tract level located within one mile of the six B2H Project segments. The minority environmental justice analysis is undertaken at the Census Block level, which allows an assessment of only the racial and ethnicity characteristics of the populations. Poverty information is only available at the Census Tract level of analysis for 2010. The populations located in these Census Blocks and

Census Tracts are compared with those of the reference communities in terms of percentages of minority and low-income populations. Reference communities for the analysis are defined as the county and/or the state in which the Census Block or Census Tract is located; if the percentages of low-income and/or minority populations within proximity to the six B2H Project segments significantly exceed those of the reference communities, further environmental justice assessment is undertaken. If no environmental justice populations are identified, no further analysis is needed.

Minority Populations

Potential environmental justice minority populations are displayed in Table 3-574. In 2010, there were 1,553 Census Blocks within one mile of the six B2H Project alternative segments. Of those, more than three-quarters of the Census Blocks (79 percent) contained no resident populations. The remaining 287 Census Blocks have a total population of 2,911. Of the remaining 287 Census Blocks, 247 Census Blocks or 86 percent did not comprise environmental justice populations and 40 Census Blocks were identified as having minority environmental justice populations. The 40 environmental justice Census Blocks have a population of 365. The distribution of the Census Blocks with potential minority environmental justice populations by county is provided in Table 3-574 and depicted on Maps 3-10a and 3-10b.

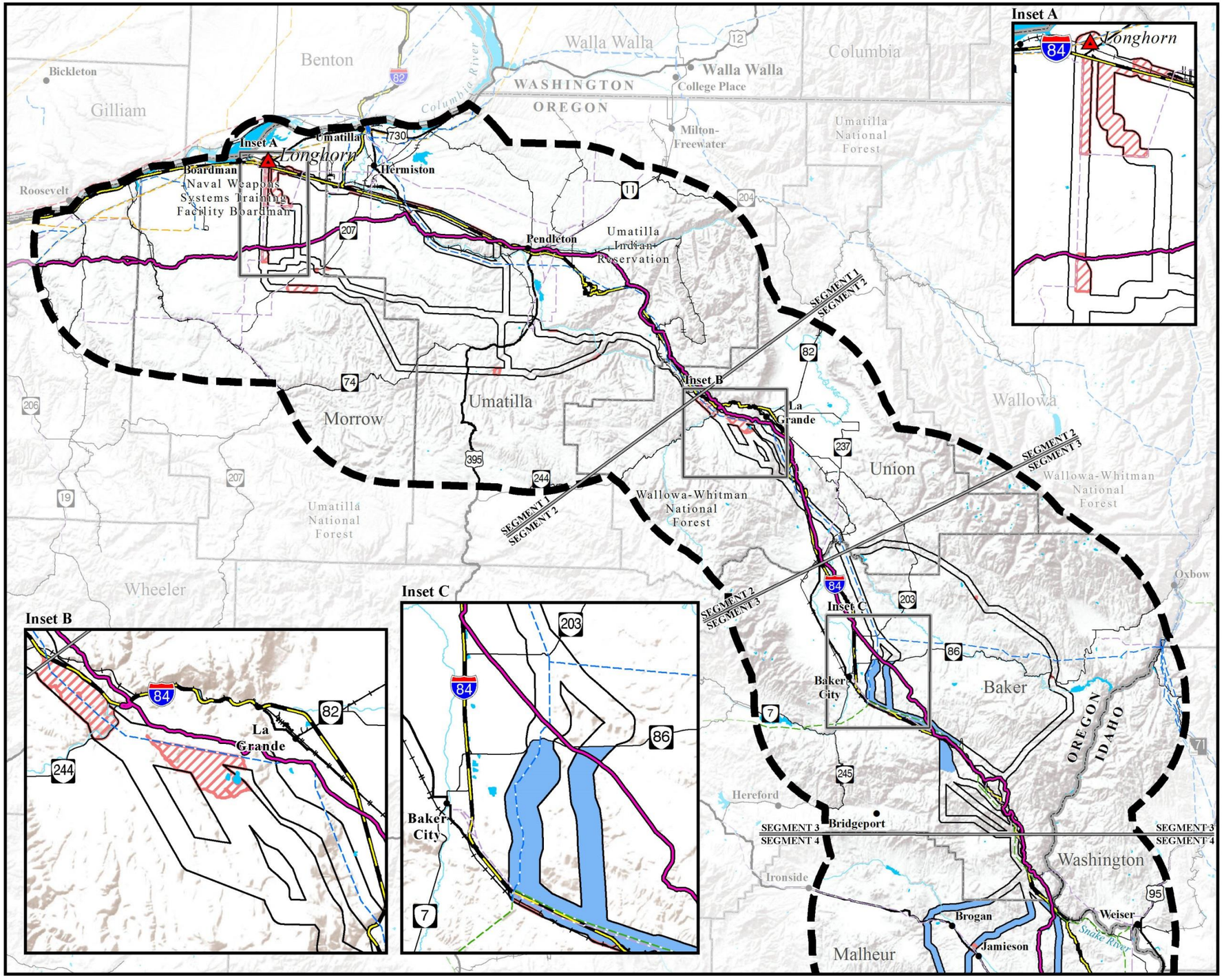
The percentage of Census Blocks identified with minority populations along each of the six B2H Project segments range from zero percent to 33 percent (refer to Table 3-575).Of the six B2H Project segments, Segment 5—Malheur has the greatest percentage (33 percent) of Census Blocks with minority environmental justice populations. Segment 6 – Treasure Valley has no Census Blocks with minority environmental justice populations.

Table 3-574. Environmental Justice Information for Minority Populations in the B2H Study Area, States, and Counties

Area	Total Population	Minority Population[1]	Percent Minority Population[1]	Threshold to Determine Environmental Justice Population	Number of Census Blocks	Number of Populated Census	Number of Census Blocks with Minority Populations Greater than Reference Community
Idaho	1,609,083	267,256	17	27	0	0	0
Owyhee County, Idaho	11,805	3,790	32	42	115	18	0
Oregon	3,988,866	880,980	22	32	0	0	0
Baker County, Oregon	16,529	1,248	8	18	526	69	9
Malheur County, Oregon	32,250	11,928	37	47	222	48	8
Morrow County, Oregon	11,484	4,102	36	46	116	25	7
Umatilla County, Oregon	78,359	24,361	31	41	343	95	14
Union County, Oregon	26,389	2,518	10	20	231	32	2
				Total	**1,553**	**287**	**40**

Table Note: [1]Minority population includes all racial groups other than white, not Hispanic or Latino.

Table 3-575. Segments and Populated Census Blocks with Minority Environmental Justice Populations			
Segment and Area	**Number of Populated Census Blocks**	**Number of Census Blocks with Minority Populations**	**Percent of Segment with Minority Populations**
Segment 1—Morrow-Umatilla			
Morrow County, Oregon	25	7	28
Umatilla County, Oregon	95	14	15
Union County, Oregon	0	0	0
Segment 1 Total	**120**	**21**	**18**
Segment 2—Blue Mountains			
Baker County, Oregon	0	0	0
Union County, Oregon	28	2	7
Segment 2 Total	**28**	**2**	**7**
Segment 3—Baker Valley			
Baker County, Oregon	65	7	11
Union County, Oregon	4	0	0
Segment 3 Total	**69**	**7**	**11**
Segment 4—Brogan			
Baker County, Oregon	4	2	50
Malheur County, Oregon	33	4	12
Segment 4 Total	**37**	**6**	**16**
Segment 5—Malheur			
Malheur County, Oregon	12	4	33
Segment 5 Total	**12**	4	**33**
Segment 6—Treasure Valley			
Owyhee County, Idaho	20	0	0
Malheur County, Oregon	1	0	0
Segment 6 Total	**21**	**0**	**0**
Total	**287**	**40**	**30**



Map 3-10a

Environmental Justice (Northern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Environmental Justice

- Areas with High Minority Population Concentrations
- Areas with High Concentrations of Low Income Populations

Project Features

- Project Area Boundary
- One-mile-wide Study Corridor
- Substation (Project Terminal)
- Segment Line

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Low Income Populations, Pinyon Environmental 2016;
Minority Populations, Pinyon Environmental 2016; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The one mile-wide study corridors (based on alternative routes) shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:950,400 or 1 inch = 15 miles

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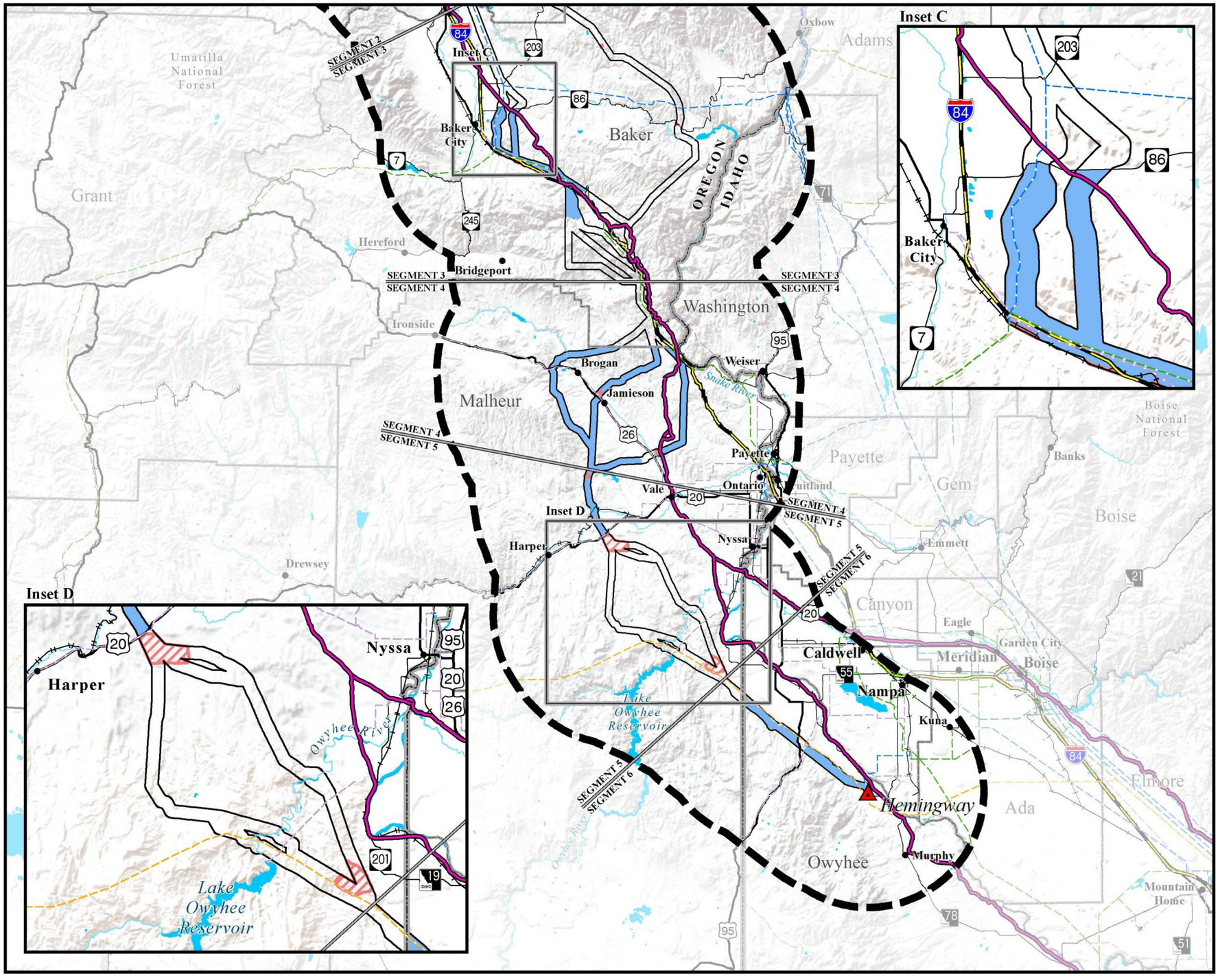

Map 3-10b

Environmental Justice (Southern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Environmental Justice

- Areas with High Minority Population Concentrations
- Areas with High Concentrations of Low Income Populations

Project Features

- Project Area Boundary
- One-mile-wide Study Corridor
- Substation (Project Terminal)
- Segment Line

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Low Income Populations, Pinyon Environmental 2016;
Minority Populations, Pinyon Environmental 2016; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The one mile-wide study corridors (based on alternative routes) shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:950,400 or 1 inch = 15 miles

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Low-Income Populations

Table 3-576 summarizes the county and state poverty populations in the B2H Project area. Of the 28 Census Block Groups within the B2H Project area, four Census Block Groups meet the U.S. Census definition of a poverty area (Table 3-576). These four Census Block Groups with low-income populations are found throughout the B2H Project area, as shown on in Maps 3-10a and 3-10b, and in Table 3-576.

Table 3-576. Environmental Justice Information for Low-Income Populations

Area	Percentage of Low-Income Households	B2H Project Segment
Idaho	**12**	**–**
Owyhee County, Idaho	**21**	**–**
Block Group 1, Census Tract 9501.01, Owyhee County, Idaho	17	Segment 6—Treasure Valley
Block Group 2, Census Tract 9501.02, Owyhee County, Idaho	16	Segment 6—Treasure Valley
Block Group 1, Census Tract 9502, Owyhee County, Idaho	**24**	Segment 6—Treasure Valley
Oregon	**13**	–
Baker County, Oregon	**19**	–
Block Group 2, Census Tract 9503, Baker County, Oregon	**30**	Segment 3—Baker Valley
Block Group 3, Census Tract 9503, Baker County, Oregon	19	Segment 3—Baker Valley
Block Group 1, Census Tract 9505, Baker County, Oregon	16	Segment 3—Baker Valley
Block Group 3, Census Tract 9506, Baker County, Oregon	18	Segment 3—Baker Valley
Malheur County, Oregon	**21**	–
Block Group 2, Census Tract 9706, Malheur County, Oregon	13	Segment 4—Brogan
Block Group 3, Census Tract 9709, Malheur County, Oregon	**20**	Segment 4—Brogan
Block Group 1, Census Tract 9707, Malheur County, Oregon	15	Segment 5—Malheur
Block Group 2, Census Tract 9709, Malheur County, Oregon	14	Segment 5—Malheur
Morrow County, Oregon	**11**	–
Block Group 2, Census Tract 9701, Morrow County, Oregon	19	Segment 1—Morrow-Umatilla
Block Group 5, Census Tract 9701, Morrow County, Oregon	8	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9702, Morrow County, Oregon	10	Segment 1—Morrow-Umatilla
Block Group 3, Census Tract 9702, Morrow County, Oregon	9	Segment 1—Morrow-Umatilla
Block Group 6, Census Tract 9702, Morrow County, Oregon	12	Segment 1—Morrow-Umatilla
Umatilla County, Oregon	**14**	–
Block Group 2, Census Tract 9400, Umatilla County, Oregon	18	Segment 1—Morrow-Umatilla
Block Group 2, Census Tract 9504, Umatilla County, Oregon	**22**	Segment 1—Morrow-Umatilla
Block Group 3, Census Tract 9505, Umatilla County, Oregon	6	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9511, Umatilla County, Oregon	17	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9513, Umatilla County, Oregon	1	Segment 1—Morrow-Umatilla
Block Group 3, Census Tract 9513, Umatilla County, Oregon	11	Segment 1—Morrow-Umatilla
Block Group 4, Census Tract 9513, Umatilla County, Oregon	12	Segment 1—Morrow-Umatilla
Block Group 1, Census Tract 9514, Umatilla County, Oregon	12	Segment 1—Morrow-Umatilla
Block Group 2, Census Tract 9514, Umatilla County, Oregon	14	Segment 1—Morrow-Umatilla

Table 3-576. Environmental Justice Information for Low-Income Populations		
Area	**Percentage of Low-Income Households**	**B2H Project Segment**
Union County, Oregon	**17**	–
Block Group 3, Census Tract 9702, Union County, Oregon	11	Segment 2—Blue Mountains
Block Group 1, Census Tract 9706, Union County, Oregon	13	Segment 2—Blue Mountains
Block Group 2, Census Tract 9706, Union County, Oregon	7	Segment 2—Blue Mountains

3.2.17.6 Environmental Consequences

The B2H Project has the potential to affect social and economic conditions in all counties in the socioeconomic study area. The following section discusses how the construction and operations of the B2H Project under the alternatives may affect the socioeconomic characteristics of the study area.

Study Methods

The environmental consequences analysis evaluates how the social and economic effects of the construction and operations phases of the B2H Project, both positive and negative, are distributed among the communities and counties in the study area. Socioeconomic impacts are described and quantified where possible. However, where quantification of impacts was not possible, the analysis included a qualitative discussion of possible effects. The analysis includes separate but integrated approaches to addressing economic, demographic, fiscal, and social impacts using the methods and approaches discussed.

Agricultural impacts associated with the construction and continued operation of the B2H Project were assessed in terms of production losses. Acres of various crops types disturbed during the construction and operations phases of the B2H Project were obtained from the land-use analysis, and an average value of production for each of these crop types was estimated with data from the National Agricultural Statistical Service including field crops, fruit and tree nuts, and vegetables for 2014. Grass and pasturelands were valued at the average rental price per acre in 2014. Production losses were valued by applying per acre values to acres disturbed and then used as inputs in a customized regional economic model known as IMPLAN® to assess how changes in agricultural production affect local economic conditions.

Estimates of construction and operation workforce were provided by the Applicant and used to describe the impacts on regional employment and population. Changes in employment and population were then used to evaluate other local impacts, such as housing, emergency services, schools, and other public and community services can be evaluated. Anticipated changes in property tax revenues associated with development and operations of the B2H Project were estimated through methods consistent with those described and applied at the state level, although the taxes are assumed primarily to accrue to the counties. For example, in Oregon utilities are centrally assessed by the Oregon Department of Revenue and transferred to the county assessment rolls where an appropriate property tax rate is applied. The average property tax levy per county is published annually by the Oregon Department of Revenue (Oregon Department of Revenue 2015) and was used for this analysis. The average tax rate

for utilities in Idaho was estimated by dividing total taxes charged against utilities by the total assessed value of utilities in 2012 (Idaho State Tax Commission 2013). It is anticipated that tax revenues would fall after the first year of service, as assessed values would consider cost of operation. A capitalization rate was applied to cost of construction to estimate the decreasing assessed valuation, to which the annual tax rate was applied.

An environmental justice analysis is conducted to determine if any environmental justice populations are present within the study area. The environmental justice analysis is conducted in compliance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and follows guidance published by the EPA (2016). The environmental justice analysis involves two basic steps:

- Determine whether environmental justice populations exist in the relevant study area
- If environmental justice populations exist, determine whether they would be disproportionately affected by development and operation of the Project

To identify the presence of potential environmental justice populations residing in proximity to the alternative routes, it is necessary to create an affected area for a smaller geographic area than that of the defined socioeconomic study area. Populations are analyzed at the Census Block Group and Census Tract level located within 1 mile of all alternative routes. The populations located in these Census Block Groups and Census Tracts are compared with those of the reference communities in terms of percentages of minority and low-income populations. Reference communities for the analysis are defined as the county and/or the state in which the Tract or Block Group was located; if the percentages of low-income and/or minority populations within proximity to the alternative routes significantly exceed those of the reference communities, further environmental justice assessment is undertaken. If no environmental justice populations are identified, no further analysis is needed.

Once the locations of the environmental justice populations are identified, all adverse effects are considered to determine whether the B2H Project has the potential to have a “disproportionately high and adverse” impact (human health or environmental effect) to these populations. Impacts of the Proposed Action include cumulative and multiple impacts, and are evaluated to determine which, if any, disproportionately and adversely affect these populations.

No Action Alternative

If no action were taken, the B2H Project would not be granted a right-of-way and the transmission line and substations would not be constructed. The human environment would remain as is and management direction from the current management plans would continue. Under the No Action, none of the social and economic impacts described under the alternative routes would be realized. However, without the B2H Project, the existing system would not be upgraded, and as a result, the Applicant would not be able to ensure sufficient capacity and reliability to meet the electric demands of its current and future customers in the Pacific Northwest and the Intermountain West. Without its development, there would be fewer high-voltage transmission lines to provide power from existing and new renewable (e.g., wind, solar) and thermal (e.g., gas, coal) generation sources to meet growing customer needs;

ease transmission congestion; and improve the flow of electricity throughout the West (refer to Chapter 1).

EFFECTS COMMON TO ALL ROUTE ALTERNATIVES AND VARIATIONS

The construction, operation, and maintenance of the proposed transmission line and related facilities are expected to have beneficial impacts on local employment and economic conditions. The largest potential impact from the B2H Project on employment would occur during the construction phase.

Population

Construction of the proposed B2H Project would occur in two geographic segments or "spreads" over 24 to 30 months. The B2H Project would be constructed primarily by contract personnel, with the Applicant responsible for B2H Project administration and inspection. The construction workforce would consist of laborers, craftspeople, supervisory personnel, support personnel, and construction management personnel who would perform the construction tasks. Construction is expected to take place year-round as weather and conditions allow. While construction during the summer season may be preferred, there are issues that may require winter construction. Weather conditions typically prohibit construction at higher elevations during winter months. Project schedule, financing, design, and/or material delivery may not fit within the summer season. Environmental issues and soil conditions also may dictate construction of portions of the line during certain times of the year, for example, to avoid or reduce impacts on wildlife.

The proposed Project and alternative routes are expected to create a short-term demand for workers during its construction. Construction workforce requirements were estimated by the Applicant's transmission engineering contractor based on average crew sizes and production rates by job type. Labor requirement projections for the two spreads are shown below in Table 3-577. These estimates are for the 500-kV transmission line component of the B2H Project and do not include estimated employment for the 138/69-kV rebuild or modifications to the Hemingway Substation.

Table 3-577. Projected Number of Workers and Population Change during Peak Construction

Workers	Construction Segment 1	Construction Segment 2
Permanent workers likely to commute to job site daily	61	63
Temporary workers likely to move to B2H Project area alone	164	169
Temporary workers likely to move to B2H Project with family[1]	18	19
Total	**243**	**251**

Table Source: Idaho Power Company 2011.

Table Note: [1]Based on data compiled by the U.S. Census Bureau (2009) as part of the 2008 American Community Survey, the average relocating family is assumed to consist of 2 adults and 1 school-age child.

Less than 10 percent of the workers temporarily relocating are expected to be accompanied by their families. Some workers like the construction supervisors and inspectors would stay the length of the B2H Project, but many workers would be employed for just 4 to 6 months. In addition, workers employed on linear projects of this sort tend to relocate along the line as needed, staying in each

location for a short period. For these reasons, workers on these types of projects do not typically bring dependents.

The maximum projected temporary workforce associated with construction spread one would be equivalent to approximately 0.2 percent of the total 2010 population in Morrow, Umatilla, Union, and Baker counties. The maximum projected temporary workforce associated with construction spread two and modifications to the Hemingway Substation would be equivalent to about 0.4 percent of the total 2010 population in Baker, Malheur, and Owyhee counties.

Existing staff of the Applicant would be responsible for the operations and maintenance of the new transmission line and associated facilities. Very few, if any, of the workers employed during the construction phase of the B2H Project would be expected to permanently relocate to the area. Therefore, B2H Project-related anticipated increases in population would be temporary in nature.

Housing

Assuming that approximately 75 percent of the peak construction workforce would temporarily relocate to the analysis area, suggests that up to 182 workers could temporarily relocate to the northwest (construction spread one) and 188 workers to the southeast (construction spread two) parts of the primary socioeconomic analysis area. An estimated 10 percent of these workers are assumed to be accompanied by their families.

Based on experience with similar projects, the Applicant's transmission engineering contractor estimates that approximately 35 percent of non-local workers would provide their own housing in the form of RVs or pop-up trailers. The remaining non-local workers would be expected to require rental housing (apartments/houses) (25 percent), mobile homes (5 percent), and motel or hotel rooms (35 percent). Construction workers, particularly those working in less populated areas, often commute relatively long distances to the job site, with commutes of up to 90 minutes each way (BLM 2014.).

Existing housing resources, rental housing, hotels and motels, and RV spaces tend to be concentrated in and around the larger communities in the analysis area. Workers temporarily relocating to the area would generally be expected to reside in or near larger communities where these housing options and services are more available. Review of the rental-housing units and hotel and motel rooms that would normally be vacant and available for rent suggests there would be sufficient housing resources available for rent in the counties that would be crossed by each construction spread.

Rental-housing resources in the counties crossed by construction spread one (Morrow, Umatilla, Union, and Baker counties) include approximately 19,114 rental units. Hotel and motel resources in these counties include approximately 2,600 rooms. Additional resources are available in the Tri-Cities of Richland, Kennewick, and Pasco, Washington, which are located about an hour drive north of Boardman, Oregon.

Rental-housing resources in the counties crossed by construction spread two (Baker, Malheur, and Owyhee counties) include approximately 12,752 units (Baker County units also included in spread one). Hotel and motel resources in these counties include approximately 1,200 rooms. Additional resources

are available in the cities of Boise and Nampa, which are in neighboring Ada and Canyon counties. Any small, short-term changes in population due to the B2H Project are expected to have minimal impacts on available housing across the region.

Once construction is complete, the operation and maintenance of the transmission line and its associated facilities will be completed by the Applicant's staff. No existing employees would be required to relocate to the socioeconomic area to operate or maintain the B2H Project. The Applicant has indicated that operations and maintenance associated with the new transmission line may result in one additional part-time position, which would be filled locally. Thus, the B2H Project is not anticipated to have any measurable effect on long-term housing availability within the socioeconomic study area.

Tribal Households and Communities

Construction of the B2H Project may temporarily restrict access to areas of the B2H Project within which Native American tribes procure subsistence resources such as gathered plants, small and large game, and fish. Noise and human activity associated during construction of the Project may disturb animals that constitute subsistence resources, causing them to temporarily leave the area. Once construction and rehabilitation activities are complete, animals normally return to these disturbed areas. Thus, construction and rehabilitation activities may adversely impact wildlife-related sustenance activities temporarily, but are not anticipated to have long-term adverse impacts on wildlife-related subsistence activities. While there is no data to quantify the percent contribution to tribal household or community income represented by these resources, adverse effects on natural resources and restricted access during construction could negatively affect tribal household's ability to continue to practice traditional ways of life.

Operation of the B2H Project may result in restriction of access to certain areas of the B2H Project, or may result in changes to vegetation or disruption to fish, small and large game populations, which could affect tribes' ability to procure subsistence resources. As there are no data to quantify the percent contribution to tribal household or community income represented by these resources, effects caused by operation are not known.

Tax Revenues

Income, Business, and Sales Taxes

Tax revenues will be generated by the B2H Project from income and business taxes. These taxes were not quantified as part of this analysis because they will be collected at the state/federal level and only a small portion will be passed along to county and city agencies. As a result, business and income taxes will likely have a very limited effect on county and city revenues.

Oregon has no local sales or use taxes. Estimated expenditures were assigned to Owyhee County, Idaho based on the share of construction activity that will take place in that county. Total expenditures for construction materials, supplies, and equipment would be estimated to average approximately $3.2 million per mile for the transmission line portion of the B2H Project. Expenditures on materials, supplies, and equipment to modify the Hemingway Substation would be estimated to be approximately $32 million. Assuming an Owyhee County sales and use tax rate of 6 percent, these expenditures would

generate tax revenues of between $3.2 and $6.5 million, which is equivalent to between five and eleven times the amount of sales and use tax revenues distributed to Owyhee County in 2015.

Operation of the B2H Project would generate sales and use tax revenues in Idaho because of local operations and maintenance expenditures. These impacts are expected to be small, especially when compared to the construction-related impacts.

Property Taxes

Estimated property tax revenues are presented by county in Table 3-578. These estimates are based on the projected value of the improvements included in the proposed B2H Project by county and average property tax rates. This table illustrates the relative contribution of the estimated B2H Project-related property tax revenues to county budgets by comparing estimated annual revenues with actual property tax revenues for 2014-2015 and 2012 by county. The table summarizes a range of tax revenues for the B2H Project based on the facilities that would be developed under each segment and alternative for all the counties. Estimated B2H Project-related property tax revenues range 1.2 percent of 2014 property tax revenues in Umatilla County to as high as 17.4 percent of property tax revenues in Baker County.

The estimates presented in Table 3-578 indicate that the B2H Project would generate annual property taxes in Owyhee County equivalent to 7.5 percent of total 2012 property tax revenues. Idaho limits the amount by which annual revenues from property tax can increase in each county. With some exceptions, this amount is limited to 3 percent based on the highest annual budget from the preceding 3 years. Exceptions include new construction (excluding public utilities), annexation, and previously unlevied funds (Houde 2012). In cases where increases in property tax revenues exceed 3 percent and are not exempt, the increase above 3 percent may provide an opportunity to lower levies for other taxpayers in the affected district.

Table 3-578. Estimated Annual Property Tax Revenues

Area	Estimated Annual Project-Related Property Taxes ($1,000)[1,2]	Actual Property Tax Imposed 2014-15 ($1,000)[1,3]	Estimated Property Tax as a Percent of 2010 Property Tax Revenues
Morrow	1,028 to 2,855	27,559	3.7 to 10.4
Umatilla	931 to 3,782	77,889	1.2 to 4.9
Union	898 to 2,156	20,716	4.5 to 10.7
Baker	814 to 3,014	17,358	4.7 to 17.4
Malheur	1,246 to 3,348	23,802	5.2 to 14.1
Owyhee	320	4,284	7.5

Table Source: Idaho State Tax Commission 2013.

Table Notes:

[1]Estimated B2H Project-related property tax revenues and actual property tax revenues from 2010 are in thousands of dollars ($000s).

[2]Property tax estimates are based on the projected value of the proposed improvements, including transmission line and substation costs. Tax revenues are estimated using applicable county property tax rates.

[3]These are actual property taxes imposed by counties in Oregon for 2014-15 (Oregon Department of Revenue 2015) and for Owyhee County for 2012 (Idaho State Tax Commission 2013).

Community Services

Solid-Waste Management

Solid waste generated during construction of the B2H Project would include a small portion of the soil and rock excavated for foundations. Other solid waste generated would include broken insulators, scrap conductor, and empty conductor spools, as well as general construction waste, such as crates, pallets, and paper wrappings used to protect equipment and materials during shipping. The B2H Project is expected to generate about 13,909 cubic yards of waste during construction (or about 124 cubic yards of waste per week). This waste would likely be disposed of at various landfills located along the B2H Project's length, and, therefore, no single landfill would be expected to accommodate the entire waste-load generated by B2H Project construction.

The Applicant will promote an aggressive recycling program to minimize the waste that will otherwise be disposed of in landfills. Wastes generated during construction will be collected in recycling and disposal containers, which will be located at multiuse areas. Separate disposal and recycling containers will be labeled by waste type to segregate materials as appropriate for recycling or disposal. Disposal and recycling containers will be of adequate size, design, and number to handle the amount of waste being generated. Landfill-supplied containers, such as 20- or 30-cubic yard rolloffs, will be used to collect scrap metal, wood and paper products, concrete waste, and other recyclable materials. Paper products and other materials such as chemicals, batteries, glass, metals, and plastic will be recycled when practical. As disposal and recycling containers reach capacity they will be sent to disposal facilities that can handle these materials, and the containers will be replaced with empty units. The Applicant's waste hauling contractor will be responsible for overseeing waste management, transporting waste to appropriate disposal facilities, and managing disposal and recycling containers.

The amounts of waste materials and wastewater generated during B2H Project operation are expected to be minimal. Wastes, including vegetative waste, derived during this part of the B2H Project will likely be recycled or disposed of off-site by individual operations and maintenance crews. Therefore, waste management impacts are expected to be low.

Representatives from the Finley Buttes Landfill, which is about 12 miles south of Boardman, indicated the landfill has 200 million cubic yards of storage, with only 8 million cubic yards of this storage used to date (Large 2011). Representatives from the Clay Peak Landfill, which is approximately 3 miles east of Payette, Idaho, indicated the landfill has 2.3 million cubic yards of storage, and there are plans to expand the facility and add about 25 million cubic yards of storage (Schmidt 2011). The amount of waste that can be received per day is not restricted for either facility (Table 3-570). Either landfill would be able to accommodate all the solid waste generated by the B2H Project (Large 2011; Schmidt 2011).

Representatives at the Baker Sanitary Landfill, which is about 7 miles south of Baker City, indicated they do not have a restriction on the amount of waste that can be accepted per day and would be able to accommodate any waste generated by the B2H Project (Freese 2011). However, the Lytle Boulevard Landfill in Vale, Oregon, indicated their facility is close to the permitted capacity for waste they can

accept per day (Geedes 2011). Therefore, only limited waste from the B2H Project would likely be sent to the Lytle Boulevard Landfill, with the remaining waste sent to other facilities.

Law Enforcement

Construction of a transmission line can result in security issues that can have impacts on local law enforcement resources. The transmission line construction site(s) could become a target for crimes (e.g., theft of construction materials or equipment). In addition, about 75 percent of the work force needed to construct the line is expected to reside permanently outside the primary socioeconomic analysis area (i.e., the counties crossed by the proposed transmission line). Workers not hired from within the region would either temporarily relocate to the affected regions or commute in from their permanent residences.

Representatives of four potentially affected sheriff's departments responded to requests for information—Baker, Malheur, Owyhee, and Umatilla County sheriffs' departments. They indicated that, while the construction site(s) could become a target for crimes and a temporary influx of construction workers could result in short-term increases in traffic incidents and other disturbances, the B2H Project was unlikely to require additional law enforcement resources or facilities (Bentz 2011; Diehl 2011; Hoagland 2011; Southwick 2011).

During operations, new access roads and the transmission line and associated facilities could slightly increase demands on local law enforcement. These impacts are expected to be low.

Fire Protection and Emergency Response

The B2H Project could result in an increased risk of fire during construction and operation. The BLM is responsible for fire suppression on the majority of the public lands crossed by the B2H Project. The Deputy Fire Management Officer for the BLM indicated the B2H Project would not affect their ability to suppress fires or require additional fire suppression resources.

The Keating Rural Fire District's fire chief expressed concerns regarding the risk of fighting fires near energized transmission lines as electricity could arc through the smoke and strike firefighters (Harper 2011). This issue is typically addressed by waiting for an electric transmission line to be de-energized before attempting to suppress fires in the immediate vicinity. This issue would be addressed through the Applicant's outreach with local fire and emergency response agencies.

A representative of the all-volunteer Union Emergency Services–Fire Department expressed concern about the potential for new construction in Union County (including recent wind-farm developments) to have adverse impacts on their resources or their ability to serve the community (Johnson 2011). Recent construction has not, however, affected the department to date, and they are currently well equipped (Johnson 2011). The Fire Chief for the North Powder Fire Department indicated that an increased risk of fire during the summer could affect his department and their equipment could need to be upgraded to address this potential increase in fire risk.

The Applicant has proposed a Framework Fire Prevention and Suppression Plan as Appendix J to the Revised POD (Idaho Power Company 2011). The Framework Plan includes provisions for sharing

responsibilities and coordination with fire-protection agencies; measures to reduce fire hazards during construction; and operations and maintenance procedures to reduce fire risk. Implementation of the Framework Fire Prevention and Suppression Plan measures would reduce the potential for the B2H Project to affect local fire departments to minor effects by reducing the risk of wildfires.

Health Care

Representatives from Saint Anthony Hospital, Grande Ronde Hospital, and Saint Alphonsus Medical Centers indicated that, given the size of the construction and operations workforces, injuries with the potential to occur during B2H Project construction and operations would not have a significant impact on these medical facilities (Blanc 2011; McCowan 2011; Vachek 2011).

Public Schools

This analysis assumes that the B2H Project would be constructed in two, approximately 150-mile-long spreads built concurrently. The estimated peak workforce in the northwest part of the analysis area (spread one) could involve up to 182 construction workers temporarily relocating to the area during construction. Assuming that 10 percent of these non-local workers would relocate with their families, up to 18 children may need to be enrolled in local schools in the northwest part of the B2H Project area. The estimated peak workforce in the southeast part of the B2H Project area (spread two) could involve the temporary relocation of up to 188 construction workers, with up to 19 children needing to be enrolled in schools in the southeast part of the B2H Project area. The school districts responded that they could accommodate these additional students.

During operations, existing staff of the Applicant would be responsible primarily for the operation and maintenance of the transmission line and associated facilities. One additional part-time position would be filled locally. No employees would be required to relocate to the B2H Project area. As a result, during operations there would be no identifiable impact on school enrollment.

Property Values (General Property Impacts and Compensation)

The proposed B2H Project would require a new right-of-way involving a combination of right-of-way grants and easements between the Applicant and federal and state governments, other companies (e.g., utilities and railroads), and private landowners (including fee acquisition). The Applicant would obtain rights-of-way on private land as perpetual easements. Easements through private lands would be negotiated between individual landowners and the Applicant during the easement acquisition process. This process is intended to provide just compensation to the landowner for the right to use the property for transmission line construction and operation. The required easements may encumber the affected right-of-way area with land-use limitations. Each easement would specify the extent of any encumbrances. Typical transmission line easement conditions include the right to clear the right-of-way and keep it clear of trees and structures, including structure-supported crops, brush, vegetation, and other potential fire and electrical hazards.

Whenever land uses change, concern is often raised about the effect the change may have on surrounding property values. The question of whether nearby transmission lines can affect residential property values has been studied extensively in the U.S. and Canada over the last 20 years or so, with

mixed results. In general, the impacts are difficult to measure, vary among individual properties, and are influenced by a number of interplaying factors, including the following:

- Proximity of residential properties to transmission line structures
- Type and size of high-voltage transmission line structures
- Appearance of easement landscaping
- Surrounding topography (Pitts and Jackson 2007)

Jackson and Pitts (2010) and Pitts and Jackson (2007) summarize the following on the impacts of high-voltage transmission lines.

- When negative impacts are present, studies report an average decline of prices from 2 to 9 percent.
- Value diminution is attributable to the visual unattractiveness of the lines, potential health hazards, disturbing sounds, and safety concerns.
- Impacts diminish as the distance between the high-voltage transmission lines and the affected properties increase, and disappear completely at a distance of 200 feet from the lines (0.04 miles).
- Where views of transmission lines and towers are completely unobstructed, negative impacts can extend up to 0.25 mile.
- If high-voltage transmission line structures are at least partially screened from view by trees, landscaping, or topography, any negative effects are reduced considerably.
- Value diminution attributed to high-voltage transmission line proximity is temporary and usually decreases over time, disappearing completely in 4 to 10 years.

Another recent study by Chalmers analyzed nearly 600 miles of a 500-kV line stretching across Montana (Chalmers 2012a, 2012b, 2012c). Chalmers' research reports on sales dynamics involving properties within 500 feet (almost 0.1 of a mile) of the centerline of the Colstrip to Townsend, Townsend to Taft, and Taft to Hot Springs 500-kV lines[9] that sold between 2000 and 2010. He found that circumstances can affect vulnerability to transmission line impacts in rural settings, including:

- When a property's sole use is residential, its vulnerability to price impacts from a transmission line increases.
- As property size increases, vulnerability to negative market impacts from a transmission line decreases.
- If substitutes are available (additional housing in an area), vulnerability to price impacts and marketing delays can increase.

Although extents vary, price impacts and market delays associated with the 500-kV line on small rural residential parcels have been noted in the Chalmers study. The same report did not find evidence of transmission line impact on sales involving producing agricultural properties, and based on a small

[9]The lines from Colstrip to Townsend are owned by NorthWestern Energy and from Townsend to Taft to Hot Springs by Bonneville Power Administration.

number of case studies, found no identifiable impact on the sales of recreationally influenced agricultural lands from the presence of the high-voltage transmission line

Studies of impacts during periods of physical change, such as new transmission line construction or structural rebuilds, generally reveal greater short-term impacts than long-term effects. However, most studies have concluded that other factors (e.g., general location, size of property or structure, improvements, irrigation potential, condition, amenities, and supply and demand factors in a specific market area) are far more important criteria than the presence or absence of transmission lines in determining the value of residential real estate.

Recreation and Tourism

The impacts on recreational resources are described in Section 3.2.8. Short- and long-term impacts associated with the development and operation of the transmission line would diminish the natural appearance and the undeveloped character of many areas along the routes, affecting vistas and scenery. In addition, depending on reclamation and implementation of mitigation measures, vehicle and ATV use could increase over the longer term because of new access roads. In total, an influx or outflow of visitors to the study area is not anticipated to occur; therefore, negligible impacts on the study area economies associated with visitor spending would occur due to these changes in recreation resources. However, there may be some adverse impacts on recreational and other nonmarket values associated with changes to scenery and vistas surrounding non-motorized and motorized trails, the National Historic Oregon Trail and Interpretive Center, semi-primitive non-motorized and motorized areas, and other areas as more access is likely through the construction of roads to build the transmission line and through the possibility of future development. These potential effects would be limited to the immediate areas of construction activity and short-term in nature. It is likely that some visitors will be discouraged to visit these areas especially during construction which can have a negative economic impact on local businesses and communities.

Environmental Justice Populations

The potential minority and low-income Census Block Groups identified in the Environmental Justice Screening Analysis are not expected to experience disproportionate impacts from the construction or operation of the B2H Project. The data suggest the B2H Project would cross Census Block Groups that could be considered minority or low-income communities. However, construction of the B2H Project is not expected to have high and adverse human-health or environmental effects on nearby communities. Construction-related impacts would likely include increases in local traffic, noise, and dust which could result in temporary delays at some highway crossings. Construction workers temporarily relocating to the B2H Project area would increase demand for local housing resources. These impacts would be temporary and localized and are not expected to be high.

Construction also would temporarily increase the demand for education, health care, and municipal services, as well as potentially increase the demand for police and fire-protection services. However, these impacts would not measurably affect the quality of services currently received by local communities and residents.

The Proposed Action does not cross any Native American reservations but is located near the Umatilla Indian Reservation.

SEGMENT 1—MORROW-UMATILLA

Segment 1 begins at the Longhorn Substation in Morrow County and ends west of La Grande in Union County on the Wallowa-Whitman National Forest. Seven alternative routes and two areas of local variations were identified in Segment 1.

Irrigated Agriculture

As discussed in Section 3.2.7, Segment 1 is the most agriculturally intensive segment of the B2H Project area. It contains extensive tracts of important farmland and high-value soils that are irrigated by center pivots, flood, and other mechanized irrigation methods. These high-value farmlands produce a variety of crops, ranging from field crops such as alfalfa and corn, to fruit and tree nuts such as blueberries and cherries, to vegetables such as onions, peas, and peppers. Transmission lines can affect these farm operations and increase costs for the farm operator.

The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way, and would negotiate damage-related issues with affected farmers during the easement acquisition process. Potential impacts depend on the transmission line design and placement, and the type of farming affected. For further information related to impacts on agriculture, refer to Section 3.2.7. These impacts generally include:

- Problems with field machinery and maintaining efficient fieldwork patterns;
- Increased soil erosion and compaction of soils
- The encroachment and spread of weeds, invasive species, and agricultural pests;
- Safety hazards associated with tower structure and conductor placement;
- Hindrance or prevention of aerial spraying or seeding activities by planes or helicopters;
- Interference with irrigation equipment;
- Hindrance of future plans for farm ground such as consolidation of farm fields or expansion of irrigation systems
- Temporary interruption of planting, irrigation, and harvesting schedules

The alternatives have been sited to follow field boundaries to the extent feasible and to avoid agricultural infrastructure to the extent possible. However, there are occasions when a transmission line must be routed through existing agricultural lands. Agricultural production may be temporarily disturbed to enable construction of B2H Project facilities such as tensioning and pulling sites and access roads for construction equipment. Because of limited time frames for seeding particular crops, landowners could lose an entire year of crops if construction schedules affected planting season. The Applicant would coordinate construction timing with affected landowners to minimize impacts on crop production. Effects on high-value agricultural lands are discussed in 3.2.7, including acres of disturbed cropland by crop type (Table 3-320, 3-321, and 3-322).

The land-use analysis determined that between 6 and 925 acres of private croplands could be disturbed during the construction of the B2H Project, depending on the alternative route. These surface disturbances may affect the production of field crops, fruits and tree nuts, grass and private pasturelands, vegetables, and products from tree farms. Short-term agricultural yield losses under the alternatives are anticipated to range between $ 4,217 under Variation S1-B2 and $666,425 under the route *East of Bombing Range Road* (Table 3-579).

Table 3-579. Lost Agricultural Production during Construction for Segment 1—Morrow to Umatilla (dollars)

Alternative Route	Value of Lost Production (dollars)					Total Value of Yield Loss
	Field Crops	Fruit and Tree Nuts	Grass/ Pasture	Vegetables	Tree Farms	
Applicant's Proposed Action	276,950	22,924	61,776	46,589	0	408,239
Variation S1-B1	*0*	*0*	*5,834*	*0*	*0*	*5,834*
Variation S1-B2	*0*	*0*	*4,21*	*0*	*0*	*4,217*
East of Bombing Range Road	322,447	34,221	66,944	166,913	75,900	666,425
Applicant's Proposed Action – Southern Route	280,945	23,255	59,882	47,261	0	411,342
West of Bombing Range Road – Southern Route	141,416	24,357	65,637	34,650	0	266,060
Longhorn	271,314	128,507	68,561	137,706	33,314	639,401
Interstate 84	200,480	34,882	69,630	174,865	0	479,857
Variation S1-A1	*65,540*	*0*	*2,574*	*8,735*	*0*	*76,850*
Variation S1-A2	*14,220*	*0*	*0*	*14,783*	*0*	*29,003*
Interstate 84 – Southern Route	213,394	35,213	67,478	176,522	0	492,607

Yield losses resulting from the construction of the B2H Project could have an adverse effect on the local economic conditions. Direct effects from reduced yields include lower local employment opportunities in the agriculture sector (direct effect) and industries that provide input supplies and support household spending (secondary effects). Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported below in Table 3-580. These impacts are anticipated to persist until temporary surface disturbances associated with construction are mitigated.

Table 3-580. Economic Losses of Reduced Yields During Construction for Segment 1—Morrow to Umatilla

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	1.48	52,211	2.6	102,779
Variation S1-B1	*0*	*0*	*0.0*	*714*
Variation S1-B2	*0*	*0*	*0.0*	*516*
East of Bombing Range Road	3.41	162,469	3.9	155,418
Applicant's Proposed Action – Southern Route	1.50	52,964	2.6	103,920

Table 3-580. Economic Losses of Reduced Yields During Construction for Segment 1—Morrow to Umatilla				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
West of Bombing Range Road – Southern Route	1.02	39,821	1.5	61,061
Longhorn	3.99	182,114	3.6	145,973
Interstate 84	2.31	113,345	2.6	104,278
Variation S1-A1	*0.26*	*7,779*	*0.5*	*21,345*
Variation S1-A2	*0.14*	*7,495*	*0.2*	*6,665*
Interstate 84 – Southern Route	2.36	115,065	2.7	108,217

Operations of the B2H Project would permanently occupy the lands on which permanent B2H Project facilities are constructed. While B2H Project structures would displace agricultural uses, most agricultural activities could continue within the right-of-way. Effects associated with operations of the B2H Project would be long term and persist for the life of the B2H Project. Activities associated with the operation and maintenance would affect crop yields and reduce agricultural production. These yield losses are estimated to be worth between $2,000 and $177,000 each growing season (Table 3-581). The long-term economic impacts of these yield losses would have direct and secondary effects on local economic conditions, resulting in fewer local jobs and less local labor income. On annual average, long-term yield losses would result in a loss of 0 to 4 direct jobs in the agriculture sector, and 0 to 1 fewer jobs in sectors that provide support services and support household consumption (Table 3-582).

Table 3-581. Value of Annual Yield Losses During Operation for Segment 1—Morrow to Umatilla (dollars)						
Alternative Route	Value of Lost Production (dollars)					Total Value of Yield Loss
	Field Crops	Fruit and Tree Nuts	Grass/ Pasture	Vegetables	Tree Farm	
Applicant's Proposed Action	74,563	6,172	16,632	12,543	0	109,910
Variation S1-B1	*0*	*0*	*2,033*	*0*	*0*	*2,033*
Variation S1-B2	*0*	*0*	*1,366*	*0*	*0*	*1,366*
East of Bombing Range Road	85,674	9,092	17,787	44,349	20,167	177,069
Applicant's Proposed Action – Southern Route	77,226	6,392	16,460	12,991	0	113,070
West of Bombing Range Road – Southern Route	44,152	7,605	20,493	10,818	0	83,069
Longhorn	72,948	34,551	18,434	37,025	8,957	171,915
Interstate 84	53,208	9,258	18,480	46,410	0	127,355
Variation S1-A1	*13,444*	*0*	*528*	*1,792*	*0*	*15,764*
Variation S1-A2	*4,266*	*0*	*0*	*4,435*	*0*	*8,701*
Interstate 84 – Southern Route	59,109	9,754	18,691	48,896	0	136,450

Table 3-582. Annual Economic Losses of Reduced Yields During Operations for Segment 1—Morrow to Umatilla				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	1.5	23,935	0.7	32,877
Variation S1-B1	*0.0*	*342*	*0.0*	*608*
Variation S1-B2	*0.0*	*247*	*0.0*	*409*
East of Bombing Range Road	3.4	39,073	1.0	52,966
Applicant's Proposed Action – Southern Route	1.5	24,117	0.7	33,822
West of Bombing Range Road – Southern Route	1.0	15,599	0.5	24,848
Longhorn	4.0	37,488	1.0	51,424
Interstate 84	2.3	28,134	0.7	38,095
Variation S1-A1	*0.3*	*4,506*	*0.1*	*4,715*
Variation S1-A2	*0.1*	*1,700*	*0.1*	*2,603*
Interstate 84 – Southern Route	2.4	28,882	0.8	40,816

Confined Animal Feeding Operation

The three CAFOs are within the study corridor could be affected by the construction and continued operations and maintenance of the new transmission line. These CAFOs are large concentrated dairy operations and are permitted for between 6,000 and 12,900 dairy cattle. CAFO operations will be affected by exclusion fencing and surface disturbances that would take land out of production. Surface disturbances discussed in 3.2.7 would affect the ratio of animal units to crop area and CAFO's ability to manage manure and meet the terms of their NPDES permits and comprehensive nutrient management plans. Since the area that could be treated with manure would be reduced, CAFOs would have to reduce the carrying capacity of dairies crossed by the B2H Project.

Adverse impacts on CAFOs would occur under four of the proposed route alignments. Surface disturbances to CAFO operations are highest under the Longhorn Alternative and could be completely avoided under most of the alternative routes. These disturbances would be highest during construction and could reduce carrying capacities between 223 and 7,836 fewer dairy cows, depending on route and alternative (Table 3-583). Reduced carrying capacities of dairies during construction of the B2H Project are expected to result in loss in production of between $118,272 and $4.2 million (Table 3-584). Reduced carrying capacities of dairies during construction of the B2H Project are expected to result in loss in production of between $464,640 and $15.6 million (Table 3-584).

Residual impacts on CAFOs once design features of the B2H Project for environmental protection are implemented would be considerably less than temporary impacts during construction. Residual impacts on carrying capacities result in reduction of 59 to 2,107 head (Table 3-583). The value of this reduced carrying capacity range from $139,392 and $4.2 million as reported in Table 3-584.

Table 3-583. Reduced Confined Animal Feeding Operation Capacities for Segment 1—Morrow to Umatilla

Alternative Route	Fewer Cows	
	Construction	Operations
Applicant's Proposed Action	0	0
Variation S1-B1	*0*	*0*
Variation S1-B2	*0*	*0*
East of Bombing Range Road	0	0
Applicant's Proposed Action – Southern Route	0	0
West of Bombing Range Road – Southern Route	0	0
Longhorn	7,836	2,107
Interstate 84	223	59
Variation S1-A1	*0*	*0*
Variation S1-A2	*232*	*70*
Interstate 84 – Southern Route	225	62

Table 3-584. Value of Lost Confined Animal Feeding Operation Carrying Capacity for Segment 1—Morrow to Umatilla

Alternative Route	Value of Lost Capacity (dollars)	
	Construction	Operations
Applicant's Proposed Action	0	0
Variation S1-B1	*0*	*0*
Variation S1-B2	*0*	*0*
East of Bombing Range Road	0	0
Applicant's Proposed Action – Southern Route	0	0
West of Bombing Range Road – Southern Route	0	0
Longhorn	15,671,040	4,213,440
Interstate 84	445,632	118,272
Variation S1-A1	*0*	*0*
Variation S1-A2	*464,640*	*139,392*
Interstate 84 – Southern Route	449,856	124,608

Reduced CAFO carrying capacities would result in an economic loss that would ripple through the socioeconomic study area's economy, reducing local opportunities for employment and income. Changes in local employment and income are reported below in Table 3-585. Direct effects associated with lower carrying capacities at the three dairies could result in up to 13 fewer jobs and $1.2 million in foregone labor income in the agricultural sector. In addition to direct effects in the agricultural sector, adverse impacts on dairy production within the B2H Project corridor could mean up to 70 fewer local jobs and $2.9 million in foregone labor income in secondary industries that provide input supplies and support household spending (Table 3-585).

Table 3-585. Annual Economic Losses Resulting from Reduced Confined Animal Feeding Operation Capacities for Segment 1— Morrow to Umatilla

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.0	0	0.0	0
Variation S1-B1	*0.0*	*0*	*0.0*	*0*
Variation S1-B2	*0.0*	*0*	*0.0*	*0*
East of Bombing Range Road	0.0	0	0.0	0
Applicant's Proposed Action – Southern Route	0.0	0	0.0	0
West of Bombing Range Road – Southern Route	0.0	0	0.0	0
Longhorn	13.1	1,236,207	70.9	2,929,698
Interstate 84	0.4	34,701	2.0	83,311
Variation S1-A1	*0.0*	*0*	*0.0*	*0*
Variation S1-A2	*0.4*	*40,897*	*2.1*	*86,864*
Interstate 84 – Southern Route	0.4	6,560	2.0	84,101

Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

Livestock Grazing

Grazing occurs on public and private rangelands in the Morrow to Umatilla study corridor, and is a source of income for private landowners. Both the USFS and BLM provide for livestock grazing on active allotments in the B2H Project area. States also lease land for grazing and have similar systems in place for management of grazing leases. Impacts on grazing on private land, other than where federally managed grazing allotments occur on private land and where land is zoned as Exclusive Range Use, are not disclosed in this EIS, as data is unavailable to identify where grazing is occurring. Acres of federally managed allotments on private land within Segment 1 are discussed in Section 3.2.7.

Short-term impacts on grazing would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Impacts on grazing operations would be temporary during the construction period and limited to areas of construction activity, and could include:

- Potential spread of noxious and invasive plant species
- Interference with livestock management
- Interference with access to livestock operations, and
- Potential increased mortality of livestock from increased traffic.
- Disturbance of calving and lambing areas

Long-term impacts on grazing allotments would result from permanent construction disturbance due to loss of vegetation on land occupied by structure pad areas, communication stations, stations and permanent access roads. During operations and maintenance, pasture and rangeland would be

removed from grazing where they are occupied by support structures, stations, regeneration stations, or access roads; the remainder of the rangeland within the right-of-way would be available for grazing.

Residual impacts on rangeland within grazing allotments crossed by the B2H Project would be low after the application of design features of the B2H Project for environmental protection (refer to Table 2-7), which would include vegetation reclamation.

Surface disturbances associated with construction and operations of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage available on designated grazing allotments, which generally provides feed during a critical time of the year when livestock transition from winter-feeding areas to summer ranges (Table 3-586).

Table 3-586. Estimated Disturbance in Designated Grazing Allotments in Segment 1—Morrow to Umatilla

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	96	26
Variation S1-B1	*102*	*35*
Variation S1-B2	*79*	*26*
East of Bombing Range Road	95	25
Applicant's Proposed Action – Southern Route	97	27
West of Bombing Range Road – Southern Route	102	32
Longhorn	98	26
Interstate 84	137	36
Variation S1-A1	*0*	*0*
Variation S1-A2	*0*	*0*
Interstate 84 – Southern Route	138	38

Estimated federal forage losses associated with surface disturbances within the study corridor are reported below in terms of AUMs, the amount of forage to fulfill the metabolic requirements by one "animal unit[10]" for one month (Table 3-587).

Table 3-587. Estimated Annual Federal Forage Losses in Segment 1—Morrow to Umatilla

Alternative Route	Animal Unit Months	
	Construction	Operations
Applicant's Proposed Action	3	<1
Variation S1-B1	*3*	*1*
Variation S1-B2	*9*	*3*
East of Bombing Range Road	3	<1
Applicant's Proposed Action – Southern Route	3	<1
West of Bombing Range Road – Southern Route	3	<1

[10]The animal unit (AU) is a standard unit used in calculating the relative grazing impact of different kinds and classes of livestock. One animal unit is defined as a 1000 lb (450 kg) beef cow with or without a nursing calf, with a daily dry matter forage requirement of 26 lb (11.8 kg).

Table 3-587. Estimated Annual Federal Forage Losses in Segment 1—Morrow to Umatilla		
Alternative Route	Animal Unit Months	
	Construction	Operations
Longhorn	3	<1
Interstate 84	3	<1
Variation S1-A1	*0*	*0*
Variation S1-A2	*0*	*0*
Interstate 84 – Southern Route	3	<1
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

In addition to federal forage losses, surface disturbances reported in Table 3-586 would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands. Although short-term and residual federal AUMs losses are minimal compared to the overall forage requirements of herds in Morrow and Umatilla counties, local ranchers generally have to offset these forage losses with more expensive supplemental feed or forage from private pasturelands. Since most ranchers operate under very tight profit margins, these higher feed costs directly affect the bottom line of small ranching operations that rely on forage within the study corridor.

Timber Resources

Impacts on forested areas and forestry operations, including timber resources, result from the removal of tall-growing trees in and adjacent to the right-of-way. Construction of the B2H Project through timber management areas and other forested lands will require the Applicant to remove trees capable of growing tall enough to interfere with the power line within the right-of-way, and adjacent hazardous trees that could fall into transmission structures and access roads. The Applicant will minimize impacts on timber resources, reduce visual contrast, and reduce habitat disruptions by selectively removing trees within and along the edges of the right-of-way. Removal of trees with a mature height above 20 feet in right-of-way would be a long-term impact, persisting for the life of the B2H Project. Once construction is complete, staging areas, pulling and tensioning sites, tower sites and access roads are revegetated with appropriate native vegetation to promote and maintain wildlife, reduce invasion pressure by non-native plant species, and mitigate impacts on wildlife habitat.

Depending on the alternative route, construction of the B2H Project would require the selective vegetation removal from approximately 122 to 387 acres of forested woodlands in the Wallowa-Whitman National Forest, on forested lands managed by the BLM and Oregon, and on private lands (Table 3-588). Forest Inventory and Analysis data for eastern Oregon indicate that more than 90 percent of forest woodlands in this segment are timberlands, forests capable of growing 20 cubic feet or more per acre per year of industrial woods (USDA 2004). Potential B2H Project impacts on timber resources include loss of harvestable timber, a loss of future timber revenue, and potential constraints

on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

As shown by Table 3-588, impacts on timber resources are anticipated to be highest under the Applicant's Proposed Action – Southern Route, where approximately 354 acres of timberland are anticipated to be disturbed during construction and 123 acres would be permanently taken out of production. Since there are no timber resources in Variation S1-A1 or S1-A2, long-term impacts on timber resources can be completely avoided through these route variations.

Table 3-588. Estimated Disturbance in Forests and Timberlands in Segment 1—Morrow to Umatilla

Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	337.6	90.9	309.0	83.2
Variation S1-B1	*130.2*	*39.1*	*119.2*	*35.8*
Variation S1-B2	*122.0*	*33.8*	*111.7*	*30.9*
East of Bombing Range Road	345.7	112.0	316.4	102.5
Applicant's Proposed Action – Southern Route	387.0	134.8	354.2	123.4
West of Bombing Range Road – Southern Route	371.2	99.8	339.8	91.4
Longhorn	358.7	112.0	328.3	102.5
Interstate 84	336.8	89.5	308.3	81.9
Variation S1-A1	*0*	*0.0*	*0*	*0.0*
Variation S1-A2	*0*	*0.0*	*0*	*0.0*
Interstate 84 – Southern Route	370.3	101.8	338.9	93.2

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project.

Indirect impacts associated with the loss of timber production may include a minimal loss or gain of work for those employed in the timber industry due to the amount of timber being processed. For example, additional jobs may be created in the forest products industry due to the removal of forestland for timber in the short-term, while jobs may be lost in the long term if these resources are removed.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-589); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-589. Number of Residences in the Study Corridor in Segment 1—Morrow to Umatilla

Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	1	2	13	26
Variation S1-B1	*0*	*1*	*0*	*2*	*2*
Variation S1-B2	*0*	*0*	*0*	*0*	*6*
East of Bombing Range Road	0	1	2	13	26
Applicant's Proposed Action to Southern Route	0	1	1	9	24
West of Bombing Range Road to Southern Route	0	1	1	6	36
Longhorn	0	2	2	12	24
I-84		2	29	35	72
Variation S1-A1	*0*	*0*	*3*	*5*	*12*
Variation S1-A2	*0*	*2*	*2*	*3*	*15*
I-84 to Southern Route	0	2	28	31	70

Conclusions

Construction of Segment 1 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 1 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 1 would be high and range between $ 266,000 under the West of Bombing Range Road – Southern Route and $666,400 under the East of Bombing Range Road Route during construction, and between $83,000 and $177,000 annually during operations. Reduced crop yields within Segment 1 will have relatively small adverse impacts on local employment and income during construction and operations. Depending on the route chosen, reduced crop yields associated with B2H surface disturbances could result in 3 to 8 fewer jobs and $100,000 to $328,000 less labor income during construction, and between 2 to 4 jobs and between $40,000 and $92,000 in labor income on annual average during operations. While these adverse economic impacts may be small in

context of the regional economy of the socioeconomic study area, these employment opportunities may be of greater importance in the local communities adjacent to Segment 1.

Construction and operation of the B2H Project would have large adverse impacts on CAFOs under the Longhorn route. The large loss in carrying capacity under this alternative would make it more difficult for affected operations to remain environmental compliant and financially viable, potentially causing local CAFOs to close. Impacts on CAFOs would be large to moderate under the two Interstate-84 Alternatives, but could be avoided under both of the Applicant's Proposed Action Alternative routes, and the routes east and west of Bombing Range Road.

Federal forage losses resulting from surface disturbances during the construction and operation of the B2H Project would be relatively small under all routes. These losses in federal would range between 3 and 12 AUMs during construction and between > 1 and 3 AUMs annually once temporarily disturbed areas are restored. In this segment, the Applicant's Proposed Action Alternative with Variation S1-B2 would have the largest adverse impact on federal forage. In addition to federal forage losses, surface disturbances reported would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Construction and operation of Segment 1 would have a relatively large impact on local timber resources under all route alternatives. Surface disturbances affected forested lands could impact between 308 acres of timberland under the Interstate-84 Route and 428 acres of timberland under the Applicant's Proposed Action Alternative with Variation S1-B1. The clearing and removal of timber to enable the construction of Segment 1 would boost economic activity in the regional logging and wood processing sectors, temporarily increasing employment and income these sectors. During operations surface disturbances in forested areas would decline as staging sites are rehabilitated and disturbed vegetation grows back. In the long-run, operations of the B2H Project would withdraw between 82 acres of timberland under the Interstate-84 Route and 119 acres under the Applicant's Proposed Action Alternative with Variation S1-B1 from future timber production.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Interstate-84 Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route.

Impacts on residential property owners would be lowest under the Longhorn and Applicant's Proposed Action to Southern Route because these routes have fewer residential structures within a half mile of centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 2—BLUE MOUNTAINS

The Blue Mountains Segment of the B2H Project area is located primarily in Union County and includes three alternative routes and six areas of local variations.

Irrigated Agriculture

Although there is designated prime farmland within the study corridor of Segment 2, agricultural use of lands within this segment of the B2H Project is relatively small. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 23 acres of private croplands could be disturbed during the construction of the B2H Project, depending on the alternative route. These surface disturbances may affect the production of field crops, grass and private pasturelands. Short-term agricultural yield losses under the alternatives are anticipated to range between $1,432 under Variation S2-C2 and $14,994 under the Mill Creek Route (Table 3-590).

Table 3-590. Lost Agricultural Production during Construction in Segment 2—Blue Mountains

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/ Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	11,686	0	1,492	0	0	13,178
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*1,480*	*0*	*0*	*0*	*0*	*1,480*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*1,538*	*0*	*0*	*0*	*0*	*1,538*
Variation S2-C2	*0*	*0*	*1,432*	*0*	*0*	*1,432*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*1,448*	*0*	*0*	*0*	*0*	*1,448*
Variation S2-F1	*8,338*	*0*	*0*	*0*	*0*	*8,338*
Variation S2-F2	*2,818*	*0*	*0*	*0*	*0*	*2,818*
Glass Hill	8,648	0	1,472	0	0	10,120
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	11,945	0	3,049	0	0	14,994

Yield losses resulting from the construction of the B2H Project could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 2 are anticipated to be low and persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported on the next page in Table 3-591.

Table 3-591. Economic Losses of Reduced Yields During Construction in Segment 2—Blue Mountains

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.03	685	0.09	3,678
Variation S2-A1	*0.00*	*0*	*0.00*	*0*
Variation S2-A2	*0.00*	*0*	*0.00*	*0*
Variation S2-B1	*0.00*	*87*	*0.01*	*443*
Variation S2-B2	*0.00*	*0*	*0.00*	*0*
Variation S2-C1	*0.00*	*90*	*0.01*	*460*
Variation S2-C2	*0.00*	*0*	*0.00*	*175*
Variation S2-E1	*0.00*	*0*	*0.00*	*0*
Variation S2-E2	*0.00*	*85*	*0.01*	*433*
Variation S2-F1	*0.02*	*489*	*0.06*	*2,494*
Variation S2-F2	*0.01*	*165*	*0.02*	*843*
Glass Hill	0.03	507	0.07	2,767
Variation S2-D1	*0.00*	*0*	*0.00*	*0*
Variation S2-D2	*0.00*	*0*	*0.00*	*0*
Mill Creek	0.04	700	0.10	3,946

Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $409 and $4,933 each growing season, and would have minimal effects on local economic conditions (Table 3-592). Direct and secondary economic impacts associated with these long-term yield losses are shown below in (Table 3-593).

Table 3-592. Lost Annual Agricultural Production During Operations in Segment 2—Blue Mountains

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	3,723	0	475	0	0	4,198
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*485*	*0*	*0*	*0*	*0*	*485*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*543*	*0*	*0*	*0*	*0*	*543*
Variation S2-C2	*0*	*0*	*409*	*0*	*0*	*409*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*452*	*0*	*0*	*0*	*0*	*452*

Table 3-592. Lost Annual Agricultural Production During Operations in Segment 2—Blue Mountains

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Variation S2-F1	*2,366*	*0*	*0*	*0*	*0*	*2,366*
Variation S2-F2	*827*	*0*	*0*	*0*	*0*	*827*
Glass Hill	2,676	0	455	0	0	3,131
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	3,930	0	1,003	0	0	4,933

Table 3-593. Annual Economic Losses of Reduced Yields During Operations in Segment 2—Blue Mountains

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.03	685	0.09	3,678
Variation S2-A1	*0.00*	*0*	*0.00*	*0*
Variation S2-A2	*0.00*	*0*	*0.00*	*0*
Variation S2-B1	*0.00*	*87*	*0.01*	*443*
Variation S2-B2	*0.00*	*0*	*0.00*	*0*
Variation S2-C1	*0.00*	*90*	*0.01*	*460*
Variation S2-C2	*0.00*	*0*	*0.00*	*175*
Variation S2-E1	*0.00*	*0*	*0.00*	*0*
Variation S2-E2	*0.00*	*85*	*0.01*	*433*
Variation S2-F1	*0.02*	*489*	*0.06*	*2,494*
Variation S2-F2	*0.01*	*165*	*0.02*	*843*
Glass Hill	0.03	507	0.07	2,767
Variation S2-D1	*0.00*	*0*	*0.00*	*0*
Variation S2-D2	*0.00*	*0*	*0.00*	*0*
Mill Creek	0.04	700	0.10	3,946

Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Blue Mountains study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 2. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

As discussed above in the Livestock Grazing section under Segment 1, activities associated with the construction and continued operation of the B2H Project may have adverse effects on grazing resources within the study corridor. Construction activities would adversely affect the access and availability of forage on affected grazing allotments; however, design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects that persist during regular operation of the B2H Project. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 2 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Acres of temporary and permanently affected designated grazing allotments during construction and operations are shown below for each alternative and local area of variation (Table 3-594).

Table 3-594. Estimated Disturbance in Designated Grazing Allotments for Segment 2—Blue Mountains

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	267	83
Variation S2-A1	*27*	*7*
Variation S2-A2	*52*	*13*
Variation S2-B1	*18*	*6*
Variation S2-B2	*0*	*0*
Variation S2-C1	*48*	*17*
Variation S2-C2	*63*	*18*
Variation S2-E1	*20*	*7*
Variation S2-E2	*31*	*10*
Variation S2-F1	*95*	*27*
Variation S2-F2	*124*	*36*
Glass Hill	277	85
Variation S2-D1	*0*	*0*
Variation S2-D2	*0*	*0*
Mill Creek	226	75

Surface disturbances associated with construction and operations of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges.

Estimated federal forage losses associated with surface disturbances within the study corridor are reported in terms of AUMs (Table 3-595). In addition to federal forage losses, surface disturbances reported would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Table 3-595. Estimated Annual Forage Losses in Segment 2—Blue Mountains		
Alternative Route	**Animal Unit Months (AUMs)**	
	Construction	**Operations**
Applicant's Proposed Action	3	1
Variation S2-A1	*3*	*<1*
Variation S2-A2	*5*	*1*
Variation S2-B1	*<1*	*<1*
Variation S2-B2	*0*	*0*
Variation S2-C1	*0*	*0*
Variation S2-C2	*0*	*0*
Variation S2-E1	*0*	*0*
Variation S2-E2	*0*	*0*
Variation S2-F1	*0*	*0*
Variation S2-F2	*0*	*0*
Glass Hill	3	1
Variation S2-D1	*0*	*0*
Variation S2-D2	*0*	*0*
Mill Creek	6	2
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

Although short-term and residual AUMs losses are minimal compared to the overall forage requirements of herds in Union County, local ranchers generally have to offset these forage losses with more expensive supplemental feed or forage from private pasturelands. Since most ranchers operate under very tight profit margins, these higher feed costs directly affect the bottom line of small ranching operations that rely on forage within the study corridor.

Timber Resources

Depending on the alternative route, construction of the B2H Project would require the selective removal of vegetation on approximately 5.5 to 301.7 acres of forested woodlands in Union County (Table 3-596). Forest Inventory and Analysis data for eastern Oregon indicated that approximately 93 percent of forest woodlands in Union County are timberlands, forests capable of growing 20 cubic feet or more per acre per year of industrial woods (USDA 2004). Potential B2H Project impacts on timber resources include loss of harvestable timber, a loss of future timber revenue, and potential constraints on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

As shown by Table 3-596, impacts on timber resources after revegetation are anticipated to be highest under the Applicant's Proposed Action Alternative, with 279.1 acres of timberland are anticipated to be disturbed during construction and 88.9 acres could be permanently taken out of production. Impacts on timber resources could be minimized under Variation S2-F2, where only 5.1 acres would be disturbed during the construction of the B2H Project. Once construction areas have been restored, less than 2 acres of timberland would be affected by the B2H Project.

Table 3-596. Estimated Disturbance in Forests and Timberlands in Segment 2—Blue Mountains				
Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	301.7	96.1	279.1	88.9
Variation S2-A1	*34.8*	*11.4*	*32.2*	*10.5*
Variation S2-A2	*42.1*	*12.9*	*39.0*	*11.9*
Variation S2-B1	*46.9*	*16.5*	*43.4*	*15.3*
Variation S2-B2	*47.7*	*18.5*	*44.2*	*17.1*
Variation S2-C1	*139.6*	*44.9*	*129.2*	*41.5*
Variation S2-C2	*136.0*	*42.5*	*125.8*	*39.3*
Variation S2-E1	*33.9*	*10.5*	*31.4*	*9.7*
Variation S2-E2	*32.9*	*12.7*	*30.4*	*11.8*
Variation S2-F1	*14.6*	*5.2*	*13.5*	*4.9*
Variation S2-F2	*5.5*	*1.8*	*5.1*	*1.7*
Glass Hill	254.8	66.2	235.7	61.2
Variation S2-D1	*68.5*	*22.5*	*63.3*	*20.8*
Variation S2-D2	*68.5*	*20.1*	*63.3*	*18.6*
Mill Creek	208.2	54.1	192.6	50.0

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project.

Indirect impacts associated with the loss of timber production may include a minimal loss or gain of work for those employed in the timber industry due to the amount of timber being processed. For example, additional jobs may be created in the forest products industry due to the removal of forestland for timber in the short-term, while jobs may be lost in the long term if these resources are removed.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-

term (Table 3-597); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-597. Number of Residences in the Study Corridor in Segment 2—Blue Mountains

Alternative Route	Crossed by the Reference Centerline	In the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	1	1	3
Variation S2-A1	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*	*0*	*0*
Variation S2-B2	*0*	*0*	*0*	*0*	*1*
Variation S2-C1	*0*	*0*	*0*	*0*	*3*
Variation S2-C2	*0*	*0*	*0*	*1*	*5*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*0*	*0*	*0*	*0*	*1*
Variation S2-F1	*0*	*0*	*1*	*1*	*0*
Variation S2-F2	*0*	*0*	*0*	*0*	*2*
Glass Hill	0	0	1	1	2
Variation S2-D1	*0*	*0*	*0*	*0*	*2*
Variation S2-D2	*0*	*0*	*0*	*0*	*2*
Mill Creek	0	0	0	9	26

Conclusions

Construction of Segment 2 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 2 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 2 would be low and range between $10,100 under the Glass Hill Route and $14,900 under the Mill Creek Route during construction, and between $3,100 and $4,900 annually during operations. Reduced crop yields within Segment 2 would have negligible adverse impacts on local employment and income during construction and operations.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project would be relatively small under all routes. These losses would range between 3 and 8 AUMs during construction, and between 1 and 2 AUMs annually once temporarily disturbed areas are restored. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Construction and operation of Segment 2 would have a relatively large impact on local timber resources under all route alternatives. Surface disturbances affecting forested lands could impact between 193 acres of timberland under the Mill Creek Route and 408 acres of timberland under the Applicant's Proposed Action Alternative with Variation S2-C1. The clearing and removal of timber to enable the construction of Segment 2 would boost economic activity in the regional logging and wood processing sectors, temporarily increasing employment and income these sectors. During operations surface disturbances in forested areas would decline as staging sites are rehabilitated and disturbed vegetation grows back. In the long-run, operations of the B2H Project would withdraw between 50 acres of timberland under the Mill Creek Route and 131 acres under the Applicant's Proposed Action Alternative with Variation S2-C1 from future timber production.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Mill Creek Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route. The number of residential property owners affected by construction and operation of the B2H Project would be considerably lower under the Applicant's Proposed Action Alternative and the Glass Hill route. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 3—BAKER VALLEY

The Baker Valley Segment of the B2H Project area is located primarily in Baker County and includes seven alternative routes and three areas of local variations.

Irrigated Agriculture

The Baker Valley Segment is less agricultural intensive than Segment 1, but considerably more intensive than Segment 2. High-value agricultural lands in this segment include prime farmland and other irrigated croplands. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 2 and 115 acres of private croplands in Segment 3 could be disturbed during the construction of the B2H Project, depending on the alternative route. These surface disturbances may affect the production of field crops, vegetables, and grass and private pasturelands. Short-term agricultural yield losses under the alternatives are anticipated to range between $1,478 under Variation S3-B1 and $76,161 under the Flagstaff A Alternative (Table 3-598).

Table 3-598. Lost Agricultural Production during Construction in Segment 3—Baker Valley

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	11,583	0	36,960	0	0	48,543
Variation S3-A1	*4,053*	*0*	*1,379*	*0*	*0*	*5,432*
Variation S3-A2	*1,331*	*0*	*1,360*	*0*	*0*	*2,691*
Variation S3-B1	*0*	*0*	*1,478*	*0*	*0*	*1,478*
Variation S3-B2	*8,454*	*0*	*0*	*0*	*0*	*8,454*
Variation S3-B3	*8,222*	*0*	*0*	*0*	*0*	*8,222*
Variation S3-B4	*20,263*	*0*	*4,138*	*4,681*	*0*	*29,083*
Variation S3-B5	*16,676*	*0*	*7,095*	*4,816*	*0*	*28,587*
Variation S3-C1	*7,692*	*0*	*32,987*	*0*	*0*	*40,678*
Variation S3-C2	*9,152*	*0*	*37,382*	*0*	*0*	*46,535*
Variation S3-C3	*7,886*	*0*	*19,325*	*0*	*0*	*27,210*
Variation S3-C4	*4,751*	*0*	*19,404*	*0*	*0*	*24,155*
Variation S3-C5	*1,771*	*0*	*28,934*	*0*	*0*	*30,705*
Variation S3-C6	*3,594*	*0*	*11,009*	*0*	*0*	*14,603*
Flagstaff A	28,698	0	42,491	4,972	0	76,161
Timber Canyon	32,576	0	25,344	0	0	57,920
Flagstaff A – Burnt River Mountain	28,957	0	29,568	5,017	0	63,542
Flagstaff B	19,998	0	35,006	0	0	55,005
Flagstaff B – Burnt River West	12,100	0	29,344	0	0	41,443
Flagstaff B – Durkee	16,993	0	14,197	0	0	31,189

Yield losses resulting from the construction of the B2H Project could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 3 are anticipated to be relatively low and persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported below in Table 3-599.

Table 3-599. Economic Losses of Reduced Yields During Construction for Segment 3—Baker Valley

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.03	679	0.20	7,990
Variation S3-A1	*0.01*	*238*	*0.03*	*1,381*
Variation S3-A2	*0.00*	*78*	*0.01*	*565*
Variation S3-B1	*0.00*	*0*	*0.00*	*181*
Variation S3-B2	*0.03*	*496*	*0.06*	*2,529*
Variation S3-B3	*0.02*	*482*	*0.06*	*2,459*
Variation S3-B4	*0.09*	*3,298*	*0.18*	*7,332*

Table 3-599. Economic Losses of Reduced Yields During Construction for Segment 3—Baker Valley				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Variation S3-B5	*0.08*	*3,148*	*0.17*	*6,642*
Variation S3-C1	*0.02*	*451*	*0.16*	*6,340*
Variation S3-C2	*0.03*	*537*	*0.18*	*7,315*
Variation S3-C3	*0.02*	*462*	*0.12*	*4,725*
Variation S3-C4	*0.01*	*279*	*0.09*	*3,797*
Variation S3-C5	*0.01*	*104*	*0.10*	*4,073*
Variation S3-C6	*0.01*	*211*	*0.06*	*2,423*
Flagstaff A	0.12	3,923	0.36	14,598
Timber Canyon	0.10	1,910	0.32	12,848
Flagstaff A – Burnt River Mountain	0.12	3,959	0.33	13,101
Flagstaff B	0.06	1,172	0.26	10,269
Flagstaff B – Burnt River West	0.04	709	0.18	7,212
Flagstaff B – Durkee	0.05	996	0.17	6,821
Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $462 and $23,329 each growing season, and would have minimal effects on local economic conditions (Table 3-600. Direct and secondary economic effects associated with these long-term yield losses are shown below in (Table 3-601).

Table 3-600. Lost Annual Agricultural Production during Operations in Segment 3—Baker Valley						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	3,620	0	11,550	0	0	15,170
Variation S3-A1	*1,066*	*0*	*363*	*0*	*0*	*1,429*
Variation S3-A2	*336*	*0*	*343*	*0*	*0*	*679*
Variation S3-B1	*0*	*0*	*462*	*0*	*0*	*462*
Variation S3-B2	*2,482*	*0*	*0*	*0*	*0*	*2,482*
Variation S3-B3	*2,249*	*0*	*0*	*0*	*0*	*2,249*
Variation S3-B4	*5,332*	*0*	*1,089*	*1,232*	*0*	*7,653*
Variation S3-B5	*4,731*	*0*	*2,013*	*1,366*	*0*	*8,111*
Variation S3-C1	*2,715*	*0*	*11,642*	*0*	*0*	*14,357*
Variation S3-C2	*3,180*	*0*	*12,989*	*0*	*0*	*16,169*
Variation S3-C3	*2,909*	*0*	*7,128*	*0*	*0*	*10,037*

Table 3-600. Lost Annual Agricultural Production during Operations in Segment 3—Baker Valley

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Variation S3-C4	*1,745*	*0*	*7,128*	*0*	*0*	*8,873*
Variation S3-C5	*776*	*0*	*12,672*	*0*	*0*	*13,448*
Variation S3-C6	*1,590*	*0*	*4,871*	*0*	*0*	*6,461*
Flagstaff A	8,790	0	13,015	1,523	0	23,329
Timber Canyon	11,673	0	9,082	0	0	20,755
Flagstaff A – Burnt River Mountain	9,049	0	9,240	1,568	0	19,857
Flagstaff B	6,063	0	10,613	0	0	16,676
Flagstaff B – Burnt River West	4,137	0	10,032	0	0	14,169
Flagstaff B – Durkee	5,972	0	4,990	0	0	10,962

Table 3-601. Annual Economic Losses of Reduced Yields during Operations in Segment 3—Baker Valley

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.01	212	0.06	2,497
Variation S3-A1	*0.00*	*63*	*0.01*	*363*
Variation S3-A2	*0.00*	*20*	*0.00*	*143*
Variation S3-B1	*0.00*	*0*	*0.00*	*57*
Variation S3-B2	*0.01*	*146*	*0.02*	*742*
Variation S3-B3	*0.01*	*132*	*0.02*	*673*
Variation S3-B4	*0.02*	*868*	*0.05*	*1,929*
Variation S3-B5	*0.02*	*893*	*0.05*	*1,885*
Variation S3-C1	*0.01*	*159*	*0.06*	*2,238*
Variation S3-C2	*0.01*	*186*	*0.06*	*2,542*
Variation S3-C3	*0.01*	*17*	*0.04*	*1,743*
Variation S3-C4	*0.01*	*102*	*0.03*	*1,395*
Variation S3-C5	*0.00*	*45*	*0.04*	*1,784*
Variation S3-C6	*0.00*	*93*	*0.03*	*1,072*
Flagstaff A	0.04	1,202	0.11	4,472
Timber Canyon	0.03	684	0.11	4,604
Flagstaff A – Burnt River Mountain	0.04	1,237	0.10	4,094
Flagstaff B	0.02	355	0.08	3,113
Flagstaff B – Burnt River West	0.01	243	0.06	2,466
Flagstaff B – Durkee	0.02	350	0.06	2,397

Table Notes: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Baker Valley study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 3. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 3 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 3 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown below in Table 3-602.

Table 3-602. Estimated Disturbance in Designated Grazing Allotments in Segment 3—Baker Valley

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	796	248
Variation S3-A1	*86*	*22*
Variation S3-A2	*80*	*20*
Variation S3-B1	*278*	*86*
Variation S3-B2	*197*	*58*
Variation S3-B3	*197*	*54*
Variation S3-B4	*163*	*43*
Variation S3-B5	*164*	*46*
Variation S3-C1	*336*	*118*
Variation S3-C2	*333*	*115*
Variation S3-C3	*271*	*100*
Variation S3-C4	*284*	*105*
Variation S3-C5	*499*	*218*
Variation S3-C6	*552*	*245*
Flagstaff A	682	208
Timber Canyon	1212	434
Flagstaff A – Burnt River Mountain	621	194
Flagstaff B	717	217
Flagstaff B – Burnt River West	850	290
Flagstaff B – Durkee	911	322

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated federal forage losses associated with surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-603).

Table 3-603. Estimated Annual Forage Losses in Segment 3—Baker Valley

Alternative Route	Animal Unit Months	
	Construction	Operations
Applicant's Proposed Action	30	9
Variation S3-A1	*2*	*<1*
Variation S3-A2	*<1*	*<1*
Variation S3-B1	*11*	*3*
Variation S3-B2	*<1*	*<1*
Variation S3-B3	*0*	*0*
Variation S3-B4	*0*	*0*
Variation S3-B5	*<1*	*<1*
Variation S3-C1	*16*	*6*
Variation S3-C2	*12*	*4*
Variation S3-C3	*11*	*4*
Variation S3-C4	*11*	*4*
Variation S3-C5	*19*	*8*
Variation S3-C6	*38*	*17*
Flagstaff A	19	6
Timber Canyon	42	20
Flagstaff A – Burnt River Mountain	14	4
Flagstaff B	19	6
Flagstaff B – Burnt River West	19	6
Flagstaff B – Durkee	41	14

Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.

Federal forage losses in Segment 3 range between 14 AUMs under the Flagstaff A – Burnt River Mountain Alternative and 68 AUMs during construction under the Applicant's Proposed Action Alternative with Variations S3-C6. Once areas temporarily disturbed during construction are restored, residual impacts could reduce the federal forage base between 4 and 26 AUMs under these alternatives. In addition to these federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Although these forage losses account for less than 1 percent of local herd's annual forage requirements, reduced forage availability within the study corridor could affect the profitability and

viability of individual operators. Since most ranchers operate under very tight profit margins, additional costs to offset forage losses with more expensive supplemental feed or private pasturelands could cause some local ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses.

Timber Resources

Depending on the alternative route in Segment 3, construction of the B2H Project would require the selective removal of vegetation on approximately 0.6 to 518.5 acres of forested woodlands in Baker County (Table 3-604). Forest Inventory and Analysis data for eastern Oregon indicated that approximately 92 percent of forest woodlands in Baker County are timberlands, forests capable of growing 20 cubic feet or more per acre per year of industrial woods (USDA 2004). Potential B2H Project impacts on timber resources include loss of harvestable timber, a loss of future timber revenue, and potential constraints on certain types of timber harvest operations adjacent to the right-of-way for safety near transmission components.

As shown by Table 3-604, impacts on timber resources after revegetation are anticipated to be highest under the Timber Canyon Alternative, with 457.7 acres of timberland anticipated to be disturbed during construction and 125.2 acres of timberland permanently taken out of production. Impacts on timber resources could be avoided or minimized under Variations S3-A1 and S3-A2, where less than one acre would be disturbed during the construction and ongoing operation and maintenance of the B2H Project.

Table 3-604. Estimated Disturbance in Forests and Timberlands in Segment 3—Baker Valley

Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	5.8	1.8	5.3	1.7
Variation S3-A1	*0.6*	*0.2*	*0.6*	*0.2*
Variation S3-A2	*0.0*	*0.0*	*0.0*	*0.0*
Variation S3-B1	*2.6*	*0.9*	*2.4*	*0.8*
Variation S3-B2	*9.8*	*3.6*	*9.0*	*3.3*
Variation S3-B3	*7.1*	*2.6*	*6.5*	*2.4*
Variation S3-B4	*7.9*	*3.5*	*7.3*	*3.2*
Variation S3-B5	*11.1*	*4.9*	*10.2*	*4.5*
Variation S3-C1	*2.4*	*0.7*	*2.2*	*0.7*
Variation S3-C2	*2.2*	*0.8*	*2.0*	*0.7*
Variation S3-C3	*27.1*	*8.5*	*24.9*	*7.8*
Variation S3-C4	*25.9*	*7.8*	*23.7*	*7.2*
Variation S3-C5	*39.1*	*13.4*	*35.8*	*12.3*
Variation S3-C6	*95.4*	*33.5*	*87.5*	*30.7*
Flagstaff A	11.5	3.0	10.5	2.8
Timber Canyon	518.5	136.5	475.7	125.2
Flagstaff A – Burnt River Mountain	34.0	8.6	31.2	7.9
Flagstaff B	9.6	3.0	8.8	2.8
Flagstaff B – Burnt River West	34.0	8.6	31.2	7.9
Flagstaff B – Durkee	91.4	25.0	83.8	22.9

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project.

Indirect impacts associated with the loss of timber production may include a minimal loss or gain of work for those employed in the timber industry due to the amount of timber being processed. For example, additional jobs may be created in the forest products industry due to the removal of forestland for timber in the short-term, while jobs may be lost in the long term if these resources are removed.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-605); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-605. Number of Residences within Study Corridor in Segment 3—Baker Valley

Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	1	3	3	12
Variation S3-A1	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*2*	*3*	*6*
Variation S3-B3	*0*	*0*	*2*	*5*	*5*
Variation S3-B4	*0*	*0*	*2*	*5*	*5*
Variation S3-B5	*0*	*0*	*2*	*3*	*6*
Variation S3-C1	*0*	*1*	*3*	*3*	*10*
Variation S3-C2	*0*	*1*	*6*	*3*	*13*
Variation S3-C3	*0*	*2*	*3*	*1*	*7*
Variation S3-C4	*0*	*2*	*3*	*1*	*5*

Table 3-605. Number of Residences within Study Corridor in Segment 3—Baker Valley					
Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Variation S3-C5	*0*	*0*	*0*	*2*	*1*
Variation S3-C6	*0*	*0*	*0*	*3*	*0*
Flagstaff A	0	1	5	6	18
Timber Canyon	1	3	9	10	26
Flagstaff A – Burnt River Mountain	0	2	5	8	17
Flagstaff B	0	1	5	8	17
Flagstaff B – Burnt River West	0	0	2	7	8
Flagstaff B – Durkee	0	0	2	8	7

Recreation and Tourism

Alternative routes proposed in Segment 3 have the potential to impact the NHOTIC which could affect the recreational experience of visitors to the site. Construction of the transmission line may affect the quantity and type of visitors coming to NHOTIC, especially in the short-term. Decreases in visitation will have a negative economic impact on local businesses and communities. These impacts are expected to be short-term and tied more to construction activities though quality of the recreation experience may be affected in the long term by the presence of an infrastructure feature near the NHOTIC. Segments with the greatest impacts on the NHOTIC would be Applicant's Proposed Action Alternative, Variations S3-B1, S3-B2, S3-B3, and less under S3-B4, S3-B5, and Flagstaff Alternatives.

Conclusions

Construction of Segment 3 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 3 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 3 would have a moderately impact private grass and pasturelands, but have a small impact on other irrigated crop lands. Agricultural yield losses in Segment 3 would range between $31,100 under the Flagstaff B – Durkee Route and $95,000 under the Applicant's -Proposed Action with Variation S3-C2 during construction of the transmission line. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $10,900 and $31,300 under these alternatives. Reduced crop yields within Segment 3 would have negligible adverse impacts on local employment and income during construction and operations. Construction and operation of Segment 3 of the B2H Project would have no identifiable impact on CAFOs within this this segment. While adverse economic impacts associated with agriculture production may be negligible in context of the regional economy of the socioeconomic study area,

these employment opportunities may be of greater importance in the local communities adjacent to Segment 3.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project would be moderate under all route alternatives in Segment 3. These losses would range between 14 AUMs under the Flagstaff A – Burnt River Mountain Alternative and 68 AUMs during construction under the Applicant's Proposed Action Alternative with Variation S3-C6. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 4 to 26 AUMs annually under these alternatives. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

With the exception of the Timber Canyon Route Alternative, construction and operation of Segment 3 would have a relatively small impact on local timber resources. Construction through forested lands would disturb nearly 476 acres of timberland under the Timber Canyon Route and between 5 and 93 acres under the Applicant's Proposed Action Alternative with Variation S3-A2 and Variation S3-C6, respectively. The clearing and removal of timber to enable the construction of Segment 3 would boost economic activity in the regional logging and wood processing sectors, temporarily increasing employment and income these sectors. During operations surface disturbances in forested areas would decline as staging sites are rehabilitated and disturbed vegetation grows back. In the long-run, operations of the B2H Project would withdraw 125 acres of timberland from production under the Timber Canyon Alternative, and between 2 and 32 acres of timberland under the Applicant's Proposed Action Alternative with Variation S3-A2 and Variation S3-C6, respectively.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Timber Canyon Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route.

Impacts on residential property owners would be lowest under the Flagstaff B- Burnt River West and Durkee Route Alternatives because these routes have fewer residential structures within a half mile of the centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

Construction of the transmission line may affect the quantity and type of visitors coming to NHOTIC, especially in the short-term. Decreases in visitation will have a negative economic impact on local businesses and communities. Segments with the greatest impacts on the NHOTIC would be Applicant's Proposed Action Alternative, Variations S3-B1, S3-B2, S3-B3, and less under S3-B4, S3-B5, and Flagstaff Alternatives.

SEGMENT 4—BROGAN

Segment 4 is located in southern Baker County and northern Malheur County and includes three alternative routes and one area of local variations

Irrigated Agriculture

Although there is designated prime farmland within the study corridor of the Brogan Segment, agricultural use of these lands are predominately for grass and pasturelands. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 53 acres of field crops and between 37 and 586 acres of private pastureland could be disturbed during the construction of the B2H Project, depending on the alternative route. Short-term agricultural yield losses under the alternatives are anticipated to range between $24,750 under Variation S4-A3 and $421,676 under the Tub Mountain South Route (Table 3-606).

Table 3-606. Lost Agricultural Production during Construction in Segment 4—Brogan

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	0	0	122,522	0	0	122,522
Variation S4-A1	*0*	*0*	*34,320*	*0*	*0*	*34,320*
Variation S4-A2	*0*	*0*	*26,294*	*0*	*0*	*26,294*
Variation S4-A3	*0*	*0*	*24,750*	*0*	*0*	*24,750*
Tub Mountain South	34,593	0	387,083	0	0	421,676
Willow Creek	33,449	0	200,475	0	0	233,924

Reduced production of field crops and grasses because of construction activities within the study corridor could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 4 are anticipated to be relatively low since most of these impacts result from affected grass and pasturelands, which are generally not very labor intensive to produce. These yield losses, and resulting economic impacts will persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported on the next page in Table 3-607.

Table 3-607. Economic Losses of Reduced Yields During Construction for Segment 4—Brogan

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	0	0.37	15,003
Variation S4-A1	*0.00*	*0*	*0.10*	*4,202*
Variation S4-A2	*0.00*	*0*	*0.08*	*3,220*
Variation S4-A3	*0.00*	*0*	*0.07*	*3,031*
Tub Mountain South	0.10	2,028	1.43	57,746
Willow Creek	0.10	1,961	0.86	34,554

Table 3-607. Economic Losses of Reduced Yields During Construction for Segment 4—Brogan				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $9,504 and $128,583 each growing season, but would have minimal effects on local economic conditions since most of these impacts are associated with the production of private grass and pasturelands (Table 3-608). Direct and secondary economic impacts associated with these long-term yield losses are shown below in (Table 3-609).

Table 3-608. Lost Annual Agricultural Production during Operations in Segment 4—Brogan						
Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	0	0	42,728	0	0	42,728
Variation S4-A1	*0*	*0*	*13,992*	*0*	*0*	3,992
Variation S4-A2	*0*	*0*	*9,926*	*0*	*0*	9,926
Variation S4-A3	*0*	*0*	*9,504*	*0*	*0*	9,504
Tub Mountain South	10,549	0	118,034	0	0	128,583
Willow Creek	10,406	0	62,370	0	0	72,776

Table 3-609. Annual Economic Losses of Reduced Yields During Operations in Segment 4—Brogan				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	0	0.13	5,232
Variation S4-A1	*0.00*	*0*	*0.04*	*1,713*
Variation S4-A2	*0.00*	*0*	*0.03*	*1,215*
Variation S4-A3	*0.00*	*0*	*0.03*	*1,164*
Tub Mountain South	0.03	618	0.44	17,609
Willow Creek	0.03	610	0.27	10,750
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Brogan study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations

within Segment 4. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 4 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 4 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown below in Table 3-610.

Table 3-610. Estimated Disturbance in Designated Grazing Allotments in Segment 4—Brogan

Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	884	310
Variation S4-A1	*133*	*54*
Variation S4-A2	*129*	*49*
Variation S4-A3	*133*	*51*
Tub Mountain South	701	215
Willow Creek	530	166

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated federal forage losses associated surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-611).

Table 3-611. Estimated Annual Forage Losses in Segment 4—Brogan		
Alternative Route	**Animal Unit Months**	
	Construction	**Operations**
Applicant's Proposed Action	74	26
Variation S4-A1	*2*	*<1*
Variation S4-A2	*2*	*<1*
Variation S4-A3	*2*	*<1*
Tub Mountain South	94	29
Willow Creek	62	19
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

Federal forage losses in Segment 4 range between 62 AUMs under the Willow Creek Alternative and 94 AUMs during construction under the Tub Mountain South Alternative. Once areas temporarily disturbed during construction are restored, residual surface disturbances are anticipated to reduce the federal forage base between 19 AUMs under the Willow Creek Alternative and 29 AUMs under the Tub Mountain South Alternative. In addition to these federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Although these forage losses account for less than 1 percent of local herd's annual forage requirements, reduced forage availability within the study corridor could affect the profitability and viability of individual operators. Since most ranchers operate under very tight profit margins, additional costs to offset forage losses with more expensive supplemental feed or private pasturelands could cause some local ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses.

Timber Resources

Regardless of the alternative route or local area of variation, activities associated with the construction and continued operations of the B2H Project will have minimal effects on timber resources within Segment 4. As shown by Table 3-612, impacts on timber resources after revegetation are anticipated to result in less than one acre of timberland along the Applicant's Proposed Action Alternative and the Willow Creek Alternative, and no identifiable impacts on timber resources during construction or operations under variations of the Applicant's Proposed Action Alternative or under the Tub Mountain South Alternative.

Table 3-612. Estimated Disturbance in Forests and Timberlands in Segment 4—Brogan				
Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	1.4	0.5	0.8	0.3
Variation S4-A1	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A2	*0.0*	*0.0*	*0.0*	*0.0*
Variation S4-A3	*0.0*	*0.0*	*0.0*	*0.0*
Tub Mountain South	0.0	0.0	0.0	0.0
Willow Creek	3.2	1.2	1.7	0.6

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project. Impacts on timber resources within this segment are not anticipated to have a measurable effect on local economic conditions.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-613); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses

Table 3-613. Number of Residences within Study Corridor in Segment 4—Brogan					
Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	0	2	3
Variation S4-A1	*0*	*0*	*0*	*2*	*0*
Variation S4-A2	*0*	*0*	*0*	*2*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*2*
Tub Mountain South	*0*	*0*	*4*	*6*	*19*
Willow Creek	*0*	*0*	*0*	*4*	*3*

Conclusions

Construction of Segment 4 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 4 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Similar to Segment 3, agricultural impacts in Segment 4 would affect private grass and pasturelands more than other irrigated crop lands. Agricultural yield losses in Segment 4 would range between $147,200 under the Applicant's Proposed Action Alternative with Variation S4-A3 and $421,600 under the Tub Mountain South during construction. Approximately 86 percent of these impacts would be associated with yield losses in grass and pasturelands. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $52,200 and $72,700 under these alternatives. Reduced agricultural yields within Segment 4 would have negligible adverse impacts on local employment and income during construction and operations.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project through Segment 4 would be moderate under all route alternatives. These losses would range between 62 and 94 AUMs under the Willow Creek Route Alternative and the Tub Mountain South Alternative, respectively. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 19 to 29 AUMs annually under these alternatives. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Impacts on Timber resources in Segment 4 would be negligible during construction and operation under all route alternatives and variations. During construction, between 0 and 1.7 acres of timberland are anticipated to be disturbed under the Tub Mountain South and Willow Creek routes, respectively. Once temporarily disturbed areas are rehabilitated, less than 1 acre of timberland would be withdrawn from timber production under all route alternatives and variations.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Tub Mountain South Route has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route.

Impacts on residential property owners would be lowest under the Applicant's Proposed Action Alternative with Variation S4-A1 and S4-A2 because these routes have fewer residential structures within a half mile of centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 5—MALHEUR

The Malheur Segment is located in Malheur County and includes three alternative routes and two areas of local variations.

Irrigated Agriculture

Agricultural use of lands within the study corridor of Segment 5 are similar to those in Segment 4. Although there is prime farmland and other irrigated croplands used for the production of field crops, agricultural lands within the study corridor are predominately used in grass and pastureland production. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 8 acres of field crops and between 9 and 598 acres of private pastureland could be disturbed during the construction of the B2H Project, depending on the alternative route. Short-term agricultural yield losses under the alternatives are anticipated to range between $5,914 under Variation S5-B1 and $396,010 under the Applicant's Proposed Action Alternative (Table 3-614).

Table 3-614. Lost Agricultural Production during Construction in Segment 5—Malheur

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	1,416	0	394,594	0	0	396,010
Variation S5-A1	*0*	*0*	*81,939*	*0*	*0*	*81,939*
Variation S5-A2	*0*	*0*	*88,862*	*0*	*0*	*88,862*
Variation S5-B1	*0*	*0*	*5,914*	*0*	*0*	*5,914*
Variation S5-B2	*5,248*	*0*	*13,398*	*0*	*0*	*18,646*
Malheur S	2,896	0	317,856	0	0	320,752
Malheur A	2,792	0	286,546	0	0	289,338

Reduced production of field crops and grasses because of construction activities within the study corridor could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 5 are anticipated to be relatively low since most of these impacts result from affected grass and pasturelands, which are generally not very labor intensive to produce. These yield losses, and resulting economic impacts will persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported on the next page in Table 3-615.

Table 3-615. Economic Losses of Reduced Yields During Construction in Segment 5—Malheur

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	83	1.20	48,742
Variation S5-A1	*0.00*	*0*	*0.25*	*10,033*
Variation S5-A2	*0.00*	*0*	*0.27*	*10,881*
Variation S5-B1	*0.00*	*0*	*0.02*	*724*
Variation S5-B2	*0.02*	*308*	*0.08*	*3,211*
Malheur S	*0.01*	*170*	*0.98*	*39,788*
Malheur A	*0.01*	*164*	*0.89*	*35,923*

Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $1,980 and $112,112 each growing season, but would have minimal effects on local economic conditions since most of these impacts are associated with the production of private grass and pasturelands (Table 3-616). Direct and secondary economic impacts associated with these long-term yield losses are shown below in (Table 3-617).

Table 3-616. Lost Annual Agricultural Production during Operations in Segment 5—Malheur

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	401	0	111,712	0	0	112,112
Variation S5-A1	*0*	*0*	*21,021*	*0*	*0*	*21,021*
Variation S5-A2	*0*	*0*	*19,747*	*0*	*0*	*19,747*
Variation S5-B1	*0*	*0*	*1,980*	*0*	*0*	*1,980*
Variation S5-B2	*1,267*	*0*	*3,234*	*0*	*0*	*4,501*
Malheur S	866	0	95,073	0	0	95,939
Malheur A	801	0	82,249	0	0	83,051

Table 3-617. Annual Economic Losses of Reduced Yields During Operations in Segment 5—Malheur

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	23	0.34	13,799
Variation S5-A1	*0.00*	*0*	*0.06*	*2,574*
Variation S5-A2	*0.00*	*0*	*0.06*	*2,418*
Variation S5-B1	*0.00*	*0*	*0.01*	*242*
Variation S5-B2	*0.00*	*74*	*0.02*	*775*
Malheur S	0.00	51	0.29	11,901
Malheur A	0.00	47	0.25	10,311

Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Malheur study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 5. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 5 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 5 were analyzed as part of the land-use analysis and are discussed in 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown in Table 3-618.

Table 3-618. Estimated Disturbance in Designated Grazing Allotments in Segment 5—Malheur		
Alternative Route	**Acres of Disturbance**	
	Construction	**Operations**
Applicant's Proposed Action	849	240
Variation S5-A1	*135*	*35*
Variation S5-A2	*147*	*33*
Variation S5-B1	*45*	*15*
Variation S5-B2	*16*	*4*
Malheur S	958	286
Malheur A	917	263

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated forage losses associated surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-619).

Table 3-619. Estimated Annual Forage Losses in Segment 5—Malheur		
Alternative Route	**Animal Unit Months**	
	Construction	**Operations**
Applicant's Proposed Action	54	15
Variation S5-A1	*2*	*<1*
Variation S5-A2	*19*	*4*
Variation S5-B1	*<1*	*<1*
Variation S5-B2	*<1*	*<1*
Malheur S	74	22
Malheur A	69	19.7
Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.		

Federal forage losses in Segment 5 range between 54 AUMs under the Applicant's Proposed Action Alternative with Variation S5-B1 or B2 and 74 AUMs during construction under the Malheur S Alternative. Once areas temporarily disturbed during construction are restored, residual surface disturbances are anticipated to reduce the federal forage base between 15 AUMs and 22 AUMs under these alternatives. In addition to federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Although these forage losses account for less than 1 percent of local herd's annual forage requirements, reduced forage availability within the study corridor could affect the profitability and viability of individual operators. Since most ranchers operate under very tight profit margins, additional

costs to offset forage losses with more expensive supplemental feed or private pasturelands may cause some local ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses under alternative routes with high long-term forage reductions.

Timber Resources

Regardless of the alternative route or local area of variation, activities associated with the construction and continued operations of the B2H Project will have minimal effects on timber resources within Segment 5. As shown by Table 3-620, impacts on timber resources after revegetation are anticipated to result in less than one acre of timberland along the Applicant's Proposed Action Alternative, Variation S5-B1, and routes Malheur S and A; there would be no identifiable impacts on timber resources during construction or operations under variations Variation S5-A1, S5-A2, S5-B2.

Table 3-620. Estimated Disturbance in Forests and Timberlands in Segment 5—Malheur

Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	1.5	0.4	0.2	0.1
Variation S5-A1	*0.0*	*0*	*0.0*	*0.0*
Variation S5-A2	*0.0*	*0.0*	*0.0*	*0.0*
Variation S5-B1	*1.1*	*0.3*	*0.2*	*0.0*
Variation S5-B2	*0.0*	*0.0*	*0.0*	*0.0*
Malheur S	1.8	0.4	0.3	0.1
Malheur A	1.1	0.3	0.2	0.0

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project. Impacts on timber resources within this segment are not anticipated to have a measurable effect on local economic conditions.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-

term (Table 3-621); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses

Table 3-621. Number of Residences within Study Corridor in Segment 5—Malheur

Alternative Route	Crossed by the Reference Centerline	In the Right-of-way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	0	0	2
Variation S5-A1	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*0*	*0*	*0*	*0*	*1*
Variation S5-B2	*0*	*0*	*0*	*2*	*1*
Malheur S	0	0	0	1	0
Malheur A	0	0	0	1	0

Conclusions

Construction of Segment 5 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 5 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 5 would be moderate and affect private grass and pasturelands more than other irrigated crop lands. Agricultural yield losses in Segment 5 would range between $289,300 under the Malheur A Route and $484,800 under the Applicant's Proposed Action Alternative with Variation S5-A2 during construction. Approximately 99 percent of these impacts would be associated with yield losses in grass and pasturelands. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $83,000 and $133,100 under Malheur A and the Applicant's Proposed Action Alternative with Variation S5-A1, respectively. Reduced agricultural yields within Segment 5 would have negligible adverse impacts on local employment and income during construction and operations.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project through Segment 5 would be moderate under all route alternatives. These losses would range between 54 and 74 AUMs under the Applicant's Proposed Action Alternative and the Malheur S Alternative respectively. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 15 to 22 AUMs annually under the Applicant's Proposed Action Alternative and the Malheur S alternatives, respectively. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Impacts on Timber resources in Segment 5 would be negligible during construction and operation under all route alternatives and variations. Less than one acre of timberland would be withdrawn from timber production during construction and operation of the B2H Project. Timber cleared and removed to construct the B2H Project in Segment 5 will have negligible effects on the logging and wood processing sectors. The long-term withdrawal of these acres from production will also have negligible impacts on these sectors.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since there are few residential structures within a half mile of centerline, impacts on residential property values are anticipated to be negligible. Idaho Power will work with property owners within the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

SEGMENT 6—TREASURE VALLEY

The Treasure Valley Segment is located entirely in Owyhee County, Idaho, and includes the proposed route located in the foothills and includes two areas of local variations.

Irrigated Agriculture

Like Segments 4 and 5, agricultural use of prime farmland and other irrigated croplands within the study corridor of the Treasure Valley Segment is predominately for grass and pastureland production. The Applicant recognizes that construction of the B2H Project may affect agricultural operations within the right-of-way and potential impacts are discussed above in Segment 1. The land-use analysis determined that between 0 and 4 acres of field crops and between 79 and 260 acres of private pastureland could be disturbed during the construction of the B2H Project, depending on the alternative route. Short-term agricultural yield losses under the alternatives are anticipated to range between $52,510 under Variation S6-A1 and $174,834 under the Applicant's Proposed Action Alternative (Table 3-622).

Table 3-622. Lost Agricultural Production during Construction in Segment 6—Treasure Valley

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	2,831	0	172,003	0	0	174,834
Variation S6-A1	*0*	*0*	*52,510*	*0*	*0*	*52,510*
Variation S6-A2	*0*	*0*	*74,052*	*0*	*0*	*74,052*
Variation S6-B1	*0*	*0*	*83,068*	*0*	*0*	*83,068*
Variation S6-B2	*0*	*0*	*60,707*	*0*	*0*	*60,707*

Reduced production of field crops and grasses because of construction activities within the study corridor could have an adverse effect on local economic conditions. Direct and secondary effects from reduced yields in Segment 6 are anticipated to be relatively low since most of these impacts result from affected grass and pasturelands, which are generally not very labor intensive to produce. These yield

losses, and resulting economic impacts will persist until temporary surface disturbances associated with construction are mitigated. Lost employment and labor income resulting from yield losses associated with the various alternative routes are reported below in Table 3-623.

Table 3-623. Economic Losses of Reduced Yields During Construction for Segment 6—Treasure Valley

Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.01	166	0.54	21,909
Variation S6-A1	*0.00*	*0*	*0.16*	*6,430*
Variation S6-A2	*0.00*	*0*	*0.22*	*9,068*
Variation S6-B1	*0.00*	*0*	*0.25*	*10,172*
Variation S6-B2	*0.00*	*0*	*0.18*	*7,434*

Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).

As discussed above in Segment 1, permanent B2H Project facilities would be constructed to maintain operations of the B2H Project. Although most agricultural activities could continue within the right-of-way, structures would displace a small proportion of agricultural uses. Yield losses associated with permanent facilities are estimated to be valued between $1,980 and $112,112 each growing season, but would have minimal effects on local economic conditions since most of these impacts are associated with the production of private grass and pasturelands (Table 3-624). Direct and secondary economic impacts associated with these long-term yield losses are shown in Table 3-625.

Table 3-624. Lost Annual Agricultural Production during Operations in Segment 6—Treasure Valley

Alternative Route	Value of Lost Production (dollars)					
	Field Crops	Fruit and Tree Nuts	Grass/Pasture	Vegetables	Tree Farm	Total Value of Yield Loss
Applicant's Proposed Action	801	0	48,695	0	0	49,496
Variation S6-A1	*0*	*0*	*7,107*	*0*	*0*	*17,107*
Variation S6-A2	*0*	*0*	*22,216*	*0*	*0*	*22,216*
Variation S6-B1	*0*	*0*	*23,351*	*0*	*0*	*23,351*
Variation S6-B2	*0*	*0*	*18,018*	*0*	*0*	*18,018*

Table 3-625. Annual Economic Losses of Reduced Yields During Operations for Segment 5—Treasure Valley				
Alternative Route	Direct Effect		Secondary Effects	
	Employment (Jobs)	Labor Income (dollars)	Employment (Jobs)	Labor Income (dollars)
Applicant's Proposed Action	0.00	47	0.15	6,202
Variation S6-A1	*0.00*	*0*	*0.05*	*2,095*
Variation S6-A2	*0.00*	*0*	*0.07*	*2,720*
Variation S6-B1	*0.00*	*0*	*0.07*	*2,859*
Variation S6-B2	*0.00*	*0*	*0.05*	*2,206*
Table Note: Analysis completed using IMPLAN 2014 Data for Ada, Canyon, and Owyhee counties in Idaho and Baker, Gilliam, Malheur, Morrow, Umatilla, and Union counties in Oregon (Minnesota IMPLAN Group 2014).				

Confined Animal Feeding Operation

The land-use analysis in 3.2.7 did not identify any CAFOs within the Treasure Valley study corridor. Thus, construction and operation activities under the alternatives are not expected to affect CAFO operations within Segment 6. There are no economic impacts associated with changes in CAFO production because of the construction or operations of the B2H Project in this segment.

Livestock Grazing

Activities associated with the construction and continued operation of Segment 6 may have adverse effects on grazing resources within the study corridor. Like the other segments, short-term impacts would result from temporary construction disturbance, including structure work areas, wire tensioning/pulling sites, helicopter fly yards, and temporary access roads. Design features of the B2H Project for environmental protection and proposed reclamation activities would reduce residual effects on livestock grazing within the study corridor over time. After reclamation, rangeland within the right-of-way would be available for grazing with the exception of areas occupied by support structures, stations, or access roads. Surface disturbances to federal, state, and federally managed allotments on private land within Segment 6 were analyzed as part of the land-use analysis and are discussed in Section 3.2.7. Total acreage of affected designated grazing allotments within each alternative and local area of variation during construction and operations are shown in Table 3-626.

Table 3-626. Estimated Disturbance in Designated Grazing Allotments in Segment 6—Treasure Valley		
Alternative Route	Acres of Disturbance	
	Construction	Operations
Applicant's Proposed Action	539	153
Variation S6-A1	*186*	*60*
Variation S6-A2	*145*	*44*
Variation S6-B1	*293*	*82*
Variation S6-B2	*298*	*88*

Surface disturbances associated with the construction, and ongoing operations and maintenance, of the B2H Project will adversely affect the forage base within the study corridor. Temporary and residual disturbances reduce the amount of forage supported by designated grazing allotments. These allotments generally provide forage during a critical time of the year when livestock transition from winter-feeding areas to summer ranges. Estimated forage losses associated surface disturbances within the study corridor are reported below in terms of AUMs (Table 3-627).

Table 3-627. Estimated Forage Losses in Segment 6—Treasure Valley

Alternative Route	Animal Unit Months	
	Construction	Operations
Applicant's Proposed Action	31	9
Variation S6-A1	*11*	*4*
Variation S6-A2	*6*	*2*
Variation S6-B1	*14*	*4*
Variation S6-B2	*18*	*5*

Table Note: Forage losses were calculated based on the percentage of land within a federal allotment disturbed during construction and operations, and the total number of federal AUMs within that allotment. These estimates do not include forage losses that would occur on state and private forage areas crossed by the B2H Project.

Federal forage losses in Segment 6 range between 37 AUMs under the Applicant's Proposed Action Alternative with local Variation S6-A2 and 49 AUMs during construction under the Applicant's Proposed Action Alternative under local Variation S6-B2. Once areas temporarily disturbed during construction are restored, residual surface disturbances are anticipated to reduce the federal forage base within the study corridor between 11 and 14 AUMs under these alternative route variations. In addition to federal forage losses, surface disturbances may also adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands. While these forage losses may affect the profitability of operators during construct, long-term impacts on the forage base within the study corridor are not anticipated to cause ranchers to reduce herd sizes or transition ranch resources from livestock production to other agricultural uses.

Timber Resources

Regardless of the alternative route or local area of variation, activities associated with the construction and continued operations of the B2H Project will have minimal effects on timber resources within Segment 5. As shown by Table 3-628, impacts on timber resources during construction and operation of the B2H Project will be negligible in Segment 6.

Table 3-628. Estimated Disturbance in Forests and Timberlands in Segment 6—Treasure Valley				
Alternative Route	Forests		Timberlands	
	Construction	Operations	Construction	Operations
Applicant's Proposed Action	3.5	1.0	0.1	0.0
Variation S6-A1	*0.4*	*0.1*	*0.0*	*0.0*
Variation S6-A2	*0.7*	*0.2*	*0.0*	*0.0*
Variation S6-B1	*2.0*	*0.5*	*0.1*	*0.0*
Variation S6-B2	*3.9*	*1.2*	*0.1*	*0.0*

Trees cleared from forested land crossed by the B2H Project may or may not be sold for timber depending on a number of factors, including the age and type of tree. Non-merchantable timber would most likely be chipped and used for mulch or other restoration purposes or burned. Some landowners may choose to clear and sell timber from forested land prior to the start of Project activities, or the Applicant may clear the land and sell the timber per its agreement with the affected landowner. When timber or other vegetative resources would be removed from federally administered lands, land managing agencies would appraise the value of forest products and authorize removal through a forest product sale, contract, permit or Federal law or regulation. The Applicant would coordinate with all affected land managers and landowners to minimize impacts on forest and timber resources and determine fair compensation for damages that would result from the construction and operation of the B2H Project. Impacts on timber resources within this segment are not anticipated to have a measurable effect on local economic conditions.

Property Values

As discussed above in *Effects Common to All Alternatives,* power transmission lines can adversely affect property values and salability of residential properties. While the construction and maintenance of the B2H Project may affect property values (and salability) on an individual basis because of the new transmission line, these impacts would be highly variable, individualized, and unpredictable. It is likely that the siting of transmission lines would moderately affect property values for residences in the short-term (Table 3-629); however, landscaping and other natural features that create visual obstructions could mitigate these temporary losses.

Table 3-629. Number of Residences within Study Corridor in Segment 6—Treasure Valley					
Alternative Route	Crossed by the Reference Centerline	In the Right-of-Way	Distance from Reference Centerline		
			0.125-mile	0.126 to 0.25-mile	0.26 to 0.5-mile
Applicant's Proposed Action	0	0	0	2	9
Variation S6-A1	0	0	0	1	2
Variation S6-A2	0	0	1	0	6
Variation S6-B1	0	0	0	1	2
Variation S6-B2	0	0	1	0	2

Conclusions

Construction of Segment 6 of the B2H Project would have a negligible impact on the populations and economic conditions of local communities within the socioeconomic study area because of the temporary nature of transmission line construction. Construction and operation of Segment 6 of the B2H Project would not result in disproportionate adverse impacts on environmental justice populations under any of the route alternatives.

Agricultural impacts in Segment 6 would be moderate and affect private grass and pasturelands more than other irrigated crop lands. Agricultural yield losses in Segment 6 would range between $227,300 and $257,900 under the Applicant's Proposed Action Alternative with Variations S6-A1 and S6-B1 respectively during construction. Approximately 99 percent of these impacts would be associated with yield losses in grass and pasturelands. After rehabilitation of temporarily disturbed areas, annual yield losses during operations of B2H would range between $66,600 and $72,800 under these respective route variations. Reduced agricultural yields within Segment 6 would have negligible adverse impacts on local employment and income during construction and operations. While adverse economic impacts associated with agriculture production may be negligible in context of the regional economy of the socioeconomic study area, these employment opportunities may be of greater importance in the local communities adjacent to Segment 6.

Federal forage losses resulting from surface disturbances during the construction of the B2H Project through Segment 6 would be moderate under all route variations. These losses would range between 37 AUMs under the Applicant's Proposed Action Alternative with local Variations S6-A2 and 49 AUMs under the Applicant's Proposed Action Alternative with Variations S6 -B2. Once temporarily disturbed areas are restored, operation of the B2H Project would reduce forage by 11 to 14 AUMs annually under these respective variations. In order to make up for these forage losses, local ranchers would have to supplement forage with more expensive grass and/ or hay feed or reduce their herd sizes. In addition to federal forage losses, surface disturbances reported would adversely impact forage availability on state and privately administered allotments crossed by the Project. Temporary and long-term forage losses would reduce county payments from federal and state revenue sharing programs, and personal income derived from leasing private lands.

Impacts on Timber resources in Segment 6 would be negligible during construction and operation under all route alternatives and variations. Less than one acre of timberland would be withdrawn from timber production during construction and operation of the B2H Project. Timber cleared and removed to construct the B2H Project in Segment 6 will have negligible effects on the logging and wood processing sectors. The long-term withdrawal of these acres from production will also have negligible impacts on these sectors.

Adverse impacts on individual residential property values would be highly variable and short-term in nature under all alternatives. Since the Applicant's Proposed Action Alternative with Variation S6-A2 has the potential to affect the greatest number of residential structures, short-term impacts would be highest under this route. Impacts on residential property owners would be lower under the other three variations of the Applicant's Proposed Action Alternative because these routes have fewer residential

structures within a half mile of centerline. Idaho Power will work with property owners in the buffer to mitigate adverse impacts during micro-siting of the towers, and would negotiate fair compensation to affected landowners for any adverse impacts they may incur as a result of the construction and operation of the Project.

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3.2.18 PUBLIC HEALTH AND SAFETY

The Public Health and Safety section responds to issues raised by the public and agencies during B2H Project scoping and preparation of the EIS related to potentially significant effects on public health and safety, including potential effects of EMFs on humans (e.g., pacemaker use) and animals.

This section has been reorganized to present information in a more readable format and includes information added to address comments on the Draft EIS.

3.2.18.1 REGULATORY FRAMEWORK

Applicable guidelines or regulations at the federal, state, or local level that may apply to EMF, audible noise, or radio noise of the proposed transmission line are discussed in this section.

ELECTRIC AND MAGNETIC FIELDS

Research on the potential influence of EMFs on organisms and human health has been conducted over many decades to understand basic interactions of EMF with biological organisms and cells and to investigate potential therapeutic applications. In the 1970s questions arose about potential adverse health effects because of some epidemiology studies that had suggested statistical associations between exposure to EMF and health conditions, including cancer. Over the past 40 years, considerable additional research has been conducted to address uncertainties in those studies and to determine if there was any consistent pattern of results from human, animal, and cell studies that would support such an association. The quantity and complexity of the research has led scientific and government health agencies to assemble multidisciplinary panels of scientists to conduct weight-of-evidence reviews and arrive at conclusions about the possible effects associated with EMF. The listing of these agencies (in ascending, chronological order of their most recent publication) is provided below:

BPA assembled research on Extremely Low-Frequency Electric and Magnetic Fields for a recent EIS analysis involving a similar 500-kV transmission line (BPA 2016)

- The National Institute for Environmental Health Sciences assembled a 30-person Working Group to review the cumulative body of epidemiologic and experimental data and provide conclusions and recommendations to the U.S. Government (Portier and Wolfe 1998, Olden 1999).
- The International Agency for Research on Cancer completed a full carcinogenic evaluation of EMF in 2002.
- The National Radiological Protection Board of the United Kingdom issued full evaluations of the research in 1992, 2001, and 2004 with supplemental updates and topic-specific reports published in the interim and subsequent to their last full evaluation in 2004 (National Radiological Protection Board 1992, 1994a, 1994b, 2001a, 2001b, 2004; Health Protection Agency 2006).

- The World Health Organization released a review in June 2007 as part of its International EMF Program to assess the scientific evidence of possible health effects of EMF in the frequency range from 0 to 300 gigahertz.
- The Health Council of the Netherlands, using other major scientific reviews as a starting point, evaluated recent studies in several periodic reports (Health Council of the Netherlands 2001, 2004, 2005, 2007, 2009).
- The Scientific Committee on Emerging and Newly Identified Health Risks issued a report to the Health Directorate of the European Commission in March 2007 and March 2009 updating previous conclusions (Scientific Steering Committee of the European Commission 1998; Scientific Committee on Toxicity, Ecotoxicity and the Environment 2001; Scientific Committee on Emerging and Newly Identified Health Risks 2007, 2009). Their most recent report was issued in January 2015, which updated their 2009 report (Scientific Committee on Emerging and Newly Identified Health Risks 2015).
- The European Commission also has funded the European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN), a network of scientists convened to perform health risk assessments and provide scientifically based recommendations to the European Commission. EFHRAN consulted other major reviews and evaluated epidemiologic and experimental research published after August 2008 to provide an updated health assessment (EFHRAN 2010, 2012).
- The International Commission on Non-Ionizing Radiation Protection (ICNIRP), the formally recognized organization for providing guidance on standards for non-ionizing radiation exposure for the World Health Organization, published a review of the cumulative body of epidemiologic and experimental data on EMF in 2003. The ICNIRP released exposure guidelines in 2010 that updated their 1998 exposure guidelines. For both guidelines, they relied heavily on previous reviews of the literature related to long-term exposure, but provided some relevant conclusions as part of their update process (ICNIRP 1998, 2010).
- The Swedish Radiation Protection Authority (SSI), which became the Swedish Radiation Safety Authority (SSM) in 2009, evaluated current studies in several reports, using other major scientific reviews as a starting point (SSI 2007, 2008; SSM 2009, 2010, 2013, 2014, 2015).

Overall, the published conclusions of these scientific review panels have been consistent. None of the panels concluded that either electric fields or magnetic fields are a known or likely cause of any adverse health effect at the long-term, low exposure levels found in the environment. As a result, no standards or guidelines have been recommended to prevent this type of exposure; however, from all the research that has been conducted, it was confirmed that short-term exposure to higher intensities of EMF (even above exposure levels of electrical and industrial workers) could produce adverse stimulation of nerves and muscles. Hence, several scientific agencies have recommended health-based guidelines to limit high intensity EMF exposure. These guidelines include exposure limits for the general public recommended by the International Committee on Electromagnetic Safety (ICES) and ICNIRP to address health and safety issues (ICES 2002; ICNIRP 2010). These guidelines are explained below.

Recommended Exposure Limits

The only confirmed relationship between electric fields or magnetic fields and an adverse biological or health effect is when electric currents, at very high levels of exposure, are experienced in the body as a shock-like effect. The levels at which these short-term effects occur are typically much higher than levels found under transmission lines and higher than levels found in most homes or commercial establishments.

Although there are no federal regulations on low-frequency EMFs in the U.S., recommendations and guidelines are provided by international organizations and U.S. nongovernment organizations. As mentioned, ICES and ICNIRP have recommended exposure limits to protect against the occurrence of these acute adverse effects from short-term exposures.

BPA follows electric field guidelines for design of new transmission lines. BPA's guidelines include guidelines of 9-kV/m maximum on the right-of-way, 2.5-kV/m maximum at the edge of the right-of-way, 5-kV/m for road crossings, and 2.5- to 3.5-kV/m in parking lots. Table 3-630 lists EMF guidelines recommended by the European Union; the IEEE; the ICES; the ICNIRP, an affiliate of the World Health Organization; and the American Conference of Governmental Industrial Hygienists (ACGIH).

Table 3-630. International Guidelines for Alternating Current Electric and Magnetic Field Levels

Agency	Exposure	Location	Electric Field (kV/m)	Magnetic Field (G)
European Union	General public	Edge of right-of-way	4.2	0.833
IEEE	Occupational	Within right-of-way	20	27.1
IEEE	General public	Within right-of-way	10	9.04
ICES	Occupational	Within right-of-way	20	27.1
ICES	General public	Edge of right-of-way	5	9.04
ICNIRP	Occupational	Within right-of-way	8.3	4.17
ICNIRP	General public	Edge of right-of-way	4.2	0.833
ACGIH	Occupational	Within right-of-way	25	10.0
ACGIH	Workers with cardiac pacemakers	Within right-of-way	1	1 (1,000 mG)

Table Sources: IEEE 2002 (Standard C95.6-2002); ICES 2002; ICNIRP 2010; ACGIH 2001.
Table Notes: In the U.S., magnetic fields are measured in G and mG; 1.0 G = 1,000 mG. Internationally, magnetic fields are reported and measured in T; 1.0 T = 1,000,000 µT. To convert, 1.0 µT = 10.0 mG or 0.1 µT = 1.0 mG.
ACGIH = American Conference of Governmental Industrial Hygienists
G = Gauss
kV/m = kilovolt per meter
mG = milligauss
ICES = International Committee on Electromagnetic Safety
ICNIRP = International Commission on Non-Ionizing Radiation Protection
IEEE = Institute of Electrical and Electronics Engineers

The federal government and Idaho have not enacted standards for EMF from transmission lines or other 60-Hertz (HZ) sources. Oregon and seven other states have regulations for low-frequency electric or magnetic field levels. These states have adopted limits for electric field strength either at the edge or within the right-of-way of transmission line corridors. For Oregon, the guideline for electric field strength is 9-kV/m within the right-of-way. Only Florida and New York currently have regulations limiting

magnetic field levels from transmission lines; these regulated levels only apply at the edge of the right-of-way and were based on an objective of preventing field levels from increasing beyond levels currently produced by existing lines and by the public.

Effects of EMF on Tribal Cultural and Religious Practices

Although no adverse human health effects of EMF have been documented, the presence of EMF is reported, through consultation with the BLM, to be of concern to tribes that report that areas in which EMF is present are rendered unsuitable for cultural and religious practices. To the extent that the B2H Project is located in areas that are considered to be of traditional use to tribes, the operation of the B2H Project could render those areas not useful for those purposes.

Effects of EMF on Wild and Domestic Animals

Research also has been conducted on the possible effect of EMF on wild and domestic animals in response to concerns about the effects of high-voltage and ultra-high-voltage transmission lines in the vicinity of farms and the natural habitat of wild animals. National agencies and universities have conducted research on an assortment of fauna using a variety of study designs, including observational studies of animals in their natural habitats and highly controlled experimental studies. The research to date does not suggest that AC magnetic or electric fields (or any other aspect of high-voltage transmission lines, such as audible noise) result in adverse effects on the health, behavior, or productivity of fauna, including livestock (e.g., dairy cows, sheep, and pigs) and a variety of other species (e.g., small mammals, deer, elk, birds,[11] and bees).

The well-established exception was reported by Greenberg et al. (1981) who studied the effect of a 765-kV transmission line on honeybee hives placed at varying distances from the transmission line's centerline with some hives exposed to EMF from the line and some shielded. Differences between the shielded and unshielded hives were reported at exposures above 4.1-kV/m, including decreases in hive weight, abnormal amounts of propolis at hive entrances, increased mortality and irritability, loss of the queen in some hives, and a decrease in the hive's overwinter survival. These adverse effects were reported only in the unshielded group. Since the shielding only prevented exposure to electric fields, not magnetic fields, the results indicate these adverse effects are attributable to electric field exposure. These results have been replicated by other investigators (Rogers et al. 1980, 1981, 1982).

Further studies indicated the effects were indirect (i.e., the electric fields did not affect the bees directly, and that electric field levels greater than 200-kV/m were required to affect the behavior of free-flying bees). Thus, heating of the hive by induced currents caused some of the adverse effects and the rest were attributed to shocks in the hive (Bindokas et al. 1988a, 1988b, 1989). Prevention is easily accomplished by placing a grounded metal cover on top of the hive. Since the nests of wild bees in the ground or in trees contain no metal or highly conductive materials, there appears to be little relevance of such effects on wild bees. At these locations, wild bees also are naturally shielded from electric

[11]Sage-grouse is a species of interest with respect to the proposed transmission line. No studies have focused specifically on sage-grouse, but are based on research on other avian species. No adverse effects of EMF on grouse would be expected. The effect of transmission line construction on grouse habitat is an issue that is addressed in Section 3.2.4.

fields. Laboratory studies indicate that bees are unable to discriminate 60-Hz magnetic fields reliably at intensities less than 4,300 mG, although they can detect fluctuations in the earth's static geomagnetic field as weak as 0.26 mG (Kirschvink et al. 1997). The difference in the sensitivity of honey bees is an illustration that a sensory mechanism has developed to detect static magnetic fields that effectively rejects extraneous signals, in this case AC (60-Hz) magnetic fields.

Field studies have been performed to monitor the behavior of large mammals in the vicinity of high-voltage transmission lines. No effects of electric or magnetic fields were evident in two studies from the northern U.S. on big game species, such as deer and elk, exposed to a 500-kV transmission line (Goodwin 1975; Picton et al. 1985). Much larger populations of animals that might spend time near a transmission line are livestock that graze under or near transmission lines.

To provide a more sensitive and reliable test for adverse effects than informal observation, scientists have studied animals continuously exposed to EMF from high-voltage lines in relatively controlled conditions. For example, grazing animals such as cows and sheep have been exposed to high-voltage transmission lines and their reproductive performance examined (Lee et al. 1996). No adverse effects were found among cattle exposed to a 500-kV direct-current overhead transmission line over one or more successive breeding events (Angell et al. 1990). Compared to unexposed animals in a similar environment, the exposure to 50-hertz fields did not affect reproductive functions or pregnancy of cows (Algers and Hennichs 1985; Algers and Hultgren 1987). Sheep and cattle exposed to EMF from transmission lines exceeding 500-kV were examined and no effect was found on the levels of hormones in the blood, weight gain, onset of puberty, or behavior (Burchard et al. 1998; Burchard et al. 2004; Lee et al. 1993; Lee et al. 1996; Stormshak et al. 1992; Thompson et al. 1995).

Effects of EMF to Vegetation

A number of studies have been carried out to assess the effect of exposure of plants to transmission-line EMFs. These studies have involved both forest species and agricultural crops. Researchers have found no adverse effects on plant responses, including seed germination, seedling emergence, seedling growth, leaf area per plant, flowering, seed production and germination of the seeds, longevity, and biomass production (Lee et al. 1996).

Research has been performed examining if EMF exposure have affected plant growth and crop production. Scientific evidence does not exist that fields produced near electric high-voltage transmission lines have a negative impact on plant life and growth. A study of 60-Hz electric fields on living plans concluded that 30- to 50-kV/m exposures to plants does not have a measurable effect on economic yield or plant life (McKee 1985). Another study concluded that crops, such as corn oats, and soybeans were unaffected by electric fields up to 16-kV/m (Hodges et al.1975).

AUDIBLE NOISE

In determining the impact of noise, the important factor is the proximity of the activity to wildlife and persons detecting the sounds. The alternative routes considered for the B2H Project traverse areas that are predominantly rural open space and remote with background noise typical of such settings. In most

cases, the closest humans would be construction workers. Where construction would occur near more populated areas, the noise from construction (blasting, implosive splicing, and subsequent maintenance) might be audible; however, such noise would be temporary and possibly considered only as a nuisance. Wildlife likely would avoid the temporary construction areas (refer to Section 3.2.4).

There are no federal or Idaho regulatory requirements for the audible noise level from transmission lines. The EPA has audible noise guidelines developed for the protection of public health and welfare that are widely accepted by state and local governments for the long-term exposure to environmental noise (EPA 1974). The EPA employs the equivalent sound level (L_{eq}) and day-night sound level (L_{dn}) metrics in its guidelines. L_{eq} is the energy-averaged sound level over a specified time, whereas the L_{dn} is a 24-hour average sound level that includes a 10 dBA penalty to sound levels during nighttime hours (10:00 pm to 7:00 am). The EPA's guideline lists an L_{dn} of 55 dBA to protect the public from interference to activity or annoyance outdoors in residential areas. Outdoor noise generally does not contribute to indoor levels, which are dominated by activities in a building or residence (EPA 1974).

State of Oregon

As a part of the ODOE EFSC process, the Applicant must provide a set of specific exhibits to document that the proposed B2H Project will meet standards established under the OAR as well as standards set by other agencies or regulations. OAR 345-021-0010(1)(x) requires "information about noise generated by construction and operation of the proposed facility, providing evidence to support a finding by the Council that the proposed facility complies with the Oregon Department of Environmental Quality's noise control standards in OAR 340-35-0035."

OAR 340-035-0035*, Noise Control Regulations for Industry and Commerce*, prescribes noise regulations applicable throughout Oregon. The ODOE is examining how these requirements may be applied to utility-scale transmission line projects.

Where the proposed transmission line involves rebuilding an existing line or is adjacent to an existing line, the interpretation of whether the site will be considered previously used or unused has not been clarified by ODOE. Some indication has been given that if a new transmission line is built within an existing right-of-way and does not modify that right-of-way, the site will be considered previously used, and the statistical noise limits established in the Oregon regulations would be applicable.

Noise-sensitive property is defined as "real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries." Property used in industrial or agricultural activities is not considered noise-sensitive unless it meets the above criteria in more than an incidental manner. Where there are no noise-sensitive properties, the allowable noise levels are not limited. The terms *noise-sensitive property* and *noise-sensitive receptor* refer to the same kinds of properties and are interchangeable. For the purposes of this EIS, the term *noise-sensitive receptor* is used throughout.

OAR 340-035-0035 sets noise limits for "quiet areas," which are defined by the Oregon rules as any lands or facilities designated by the ODEQ as an appropriate area where the qualities of serenity,

tranquility, and quiet are of extraordinary significance and serve an important public need. There are no ODEQ- designated “quiet areas” identified within the study corridor.

OAR 340-035-0035(5) and (6) specifically exempts construction activity from the state noise standards and regulations. This section of the Oregon rules also provides an exemption for the maintenance of capital equipment, the operation of aircraft (such as helicopters used in B2H Project construction), and sounds created by activities related to timber harvest.

County Audible Noise Regulations

The proposed B2H Project, including alternative routes, traverses six counties: Morrow, Umatilla, Union, Baker, and Malheur in Oregon and Owyhee in Idaho. None of the counties have noise ordinances or bylaws directly applicable to the B2H Project, nor any nuisance ordinances that contain decibel limits. The Oregon counties defer to OAR Chapter 340, Division 35, for the purposes of assessing compliance, given the stringency of these criteria limits. The 2016 Umatilla County Development Code includes noise in its conditional-use permit criteria.

RADIO NOISE

Electromagnetic interference from power transmission systems in the U.S. is governed by the Federal Communication Commission’s (FCC) *Rules and Regulations* (FCC 2016). A power transmission line is categorized by the FCC as an incidental radiation device, which is “a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy.” Such a device “shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference.” In this case, harmful interference is defined as “any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio-communication service operating in accordance with this chapter” (FCC 2016).

Historically, transmission line operators have not had difficulty operating under the present FCC rules since most sources of harmful interference are due to gap-type discharges that can be identified and repaired (Loftness 1980). Residences very near transmission lines, however, may be affected by corona-type radio noise in foul weather. For this reason, the *Radio Noise Design Guide* (IEEE 1971) identifies an acceptable limit of average fair-weather radio noise of 40 dBµV/m at 100 feet (30 meters) from the outside conductor.

PACEMAKERS

Implanted cardiac pacemakers are designed to detect abnormal electrical signals from the beating heart and administer therapy in the form of electrical pulses through implanted electrodes to maintain or restore normal heart function. Many sources of EMF at a variety of frequencies have been reported to affect pacemaker function including iPods and other personal MP3 players; cell phones; wireless phones; electric pencil sharpeners; power tools; anti-theft and security devices in stores, libraries, and airports; video games; ordinary magnets (i.e., on refrigerators or kitchen cabinets); escalators; and

electric vehicle ignitions and motors among other sources. If pacemaker wearers, however, avoid proximity to these devices, then their pacemakers will not be subject to potential interference from EMF.

Literature suggests pacemakers also can be affected by EMF from utility power sources and may be somewhat more sensitive to 60-Hz electric fields than 60-Hz magnetic fields. Buildings, walls, shrubbery, and vehicles—among other conductive objects—can effectively shield electric fields under most circumstances, thereby lessening this potential for effect on pacemakers. The manufacturers of pacemakers also have designed their devices in various ways to minimize potential interference from endogenous sources (e.g., muscle potentials) and interference by conducted currents from exogenous sources (e.g., touching electrical appliances). These measures also serve to minimize potential interference by electric fields. To protect the patient, most pacemakers (particularly new ones) are designed to filter out external electrical signals and go into an automatic pacing mode when interference is detected.

The expected electric field level at the edge of the proposed right-of-way for the B2H Project is less than 1.13-kV/m without taking into account any shielding provided by objects in the environment (fences, shrubbery, buildings); and the magnetic field level is 40.4 mG (Section 3.2.18.5). While there is no universal guidance as to acceptable levels of EMF for pacemakers, the ACGIH has recommended guidelines for various occupational exposures, including EMF. These guidelines are designed to identify levels to which nearly all workers may be repeatedly exposed without adverse effect and, for EMF, suggest patients with pacemakers or similar devices limit their exposure to electric fields to 1-kV/m and magnetic fields to 1,000 mG (ACGIH 2009). As shown in Section 3.2.18.5, the field levels diminish quickly with distance from the conductors (Figures 3-14, 3-15, and 3-16). Therefore, the expected levels of EMF just outside the right-of-way would be below the ACGIH's guideline levels.

INDUCTION AND FIELD PERCEPTION

Short-term effects from transmission line electric fields are associated with perception of induced currents and voltages or perception of the field. Under certain conditions, the electric field can be perceived through hair movement on an upraised hand or arm of a person standing on the ground under high-voltage transmission lines. This perception is most likely to occur at midspan under a high-voltage transmission line and less likely to occur in locations where the electric field is less than 2-kV/m. Therefore, it is unlikely the field would be perceived beyond the edge of the right-of-way. The presence of vegetation may shield the electric field and prevent perception. Persons in the cabs of trucks or other vehicles are shielded by the conductive metal of the vehicle from the electric field and from induced effects such as shocks.

Induced current or spark discharge shocks can be experienced under certain conditions when a person contacts objects in an electric field. Such effects occur in the fields associated with transmission lines that have voltages of 230-kV or higher. Shocks of a magnitude that could be harmful from induced currents would not occur under the existing or proposed lines because clearances aboveground required by the NESC preclude such shocks from large vehicles, and grounding practices eliminate large stationary objects as sources of such shocks.

Minor shocks that produce no harm can be annoying or unexpected and can occur under higher voltage transmission lines when making contact with ungrounded conducting objects (e.g., vehicles or equipment). These shocks would be uncommon and mostly perceived as a nuisance when they occur. Shocks from electric field induction on large metal objects next to the right-of-way, or magnetic induction on fences, irrigation pipes, pipelines, electrical distribution lines, or telephone lines that form a conducting loop for long distances parallel to a transmission line, can be prevented by utility policies for routinely grounding such installations located on or near the right-of-way.

Limiting the possibility of induced currents flowing from farm machinery and large vehicles under transmission lines to persons is accomplished by maintaining sufficient conductor clearance above vehicles in the final design. This is so the induced short-circuit current in the largest anticipated vehicle under the line is limited to 5 milliamperes or less per the NESC.

Vehicles should not be refueled under the proposed transmission line unless specific precautions are taken to ground the vehicle and the fueling source.

3.2.18.2 Issues Identified for Analysis

The issues identified for analysis in this section are outlined below. Detailed explanation in this section provides further details to each issue.

Electrical Environment

- Would electrical fields interfere or cause harm to nearby metal objects, such as vehicles, animal feeders, watering stations, or other equipment and fences?
- Would electrical fields effect or cause harm to people, livestock, and wildlife?
- Will there be any interference from electrical fields to communications or navigation services?

Noise

- Would noise from construction or the electrical line be harmful to people, livestock, and wildlife?
- Will noise from the power line affect livestock?
- Consultation with Native American sovereign tribal governments that consider portions of, or the entirety of the B2H Project area to be part of their traditional use areas, indicate that tribes are concerned with the ambient noise that is produced from operation of the transmission line as it affects their ability to conduct practices related to their cultural traditions and religion.

3.2.18.3 Methods

The general study methods used to analyze the impacts of the B2H Project in this EIS are described in Section 3.1.2. This section discusses how the study methods are applied to assess the impacts of the B2H Project of noise and electrical environments.

DATA SOURCES

Information provided by the Applicant and BPA regarding electrical field modeling and noise levels were used in the analysis of this section, along with current peer-reviewed scientific literature from national and international agencies.

ANALYSIS AREA

Electrical Environment

The electrical environment study corridor is the land directly under and adjacent to the B2H Project. The typical right-of-way width would be 250 feet, with a 100- foot-wide right-of-way for the 138/69-kV portions of the B2H Project. Profiles of the expected levels of EMFs generated by the B2H Project are calculated to a distance of 300 feet on both sides of the centerlines of the proposed and alternative routes.

Noise

To analyze potential noise impacts, the best available GIS data was used to identify residential and other structures, recreation facilities and other sensitive receptors within 0.5 mile of centerline of the alternative routes.

Due to the revisions of the alternative routes and new additional routes added into the Final EIS analysis, the noise modeling was not able to be updated for sensitive receptors along each route. Associated text and tables have been removed from the Final EIS, but if determined necessary, new models can be run and the information added back in. Typically detailed noise models are not conducted for EIS level analysis of transmission lines and alternative routes, and we recommend it should be deferred to the Oregon EFSC application process to develop such detailed studies on a final selected route.

IMPACT ASSESSMENT AND MITIGATION PLANNING

Effects Analysis

The effects analysis is a qualitative assessment of the impacts that may occur from the B2H Project including potential for increased levels of EMF, audible noise, and radio noise along the B2H Project study corridor.

Mitigation and Planning Effectiveness

There are no selective mitigation measures identified for public health and safety because the conditions for permitting of the B2H Project would include industry best management practices, electric field guidelines for design of new transmission lines, and mitigation measures specific to the compliance with the EFSC permitting process. In addition, mitigation measures may be identified for compliance with Oregon noise guidelines resulting from the noise study completed during final design.

Additional Analysis

No additional analysis was performed for public health and safety resources.

The impact analysis for public health and safety differs from other resources in that high, moderate, and low were not used to quantitatively assess the level of impacts, as was done for most other resources. Instead, qualitative analysis was conducted to identify whether impacts on public health and safety would occur at a high, moderate, or low level.

Initial impacts are those effects resulting from the implementation of the B2H Project, including implementation of design features of the B2H Project for environmental protection. The specific design features relevant to public health and safety include:

- ***Design Feature 1 (Plan of Development)*** would be applied based on requirements from land-managing and/or regulatory agencies including the preparation of Spill Prevention, Containment, and Countermeasure Plan Framework, Hazardous Materials Management Plan Framework, and the Emergency Preparedness and Response Plan Framework to be finalized prior to the ROD.
- ***Design Feature 26 (Reduce Corona)*** would be applied to reduce audible noise, radio and television interference, and power losses that would in operating inefficiencies.
- ***Design Feature 27 (Respond to Complaints to Radio or Television Interference)*** would be applied to maintain the transmission line to avoid or minimize line-generated radio and television interference.

3.2.18.4 Affected Environment

Electromagnetic Fields and Corona Effects

As proposed, the B2H Project includes a new single-circuit 500-kV AC transmission line beginning at the Longhorn Substation near Boardman in Morrow County, connecting to the Hemingway Substation in Owyhee County, Idaho.

The proposed circuits along the route from Boardman to Hemingway would be sources of 60-Hz EMF, audible noise, and radio noise. To characterize the potential effect of the proposed B2H Project, the EMF, audible noise, and radio noise levels under existing and proposed conditions were modeled for representative configurations of proposed circuits.

Magnetic Fields

The current flowing in the conductors of a transmission line generates a magnetic field near the transmission line. The strength of B2H Project-related magnetic fields is expressed as magnetic flux density in units of milligauss (mG), where 1 Gauss = 1,000 mG[12]. It is important to consider that load current, expressed in units of amperes, generates magnetic fields around transmission line conductors. Measurements of the magnetic field present a snapshot of the load conditions at a point in time. On a given day, throughout a week, or over the course of months and years, the magnetic field level can change depending on the patterns of power demand in the surrounding region.

[12]Scientists more commonly refer to magnetic flux density at these levels in units of microtesla. Magnetic flux density in mG units can be converted to microtesla by dividing by 10 (i.e., 1 mG = 0.1 microtesla).

ELECTRIC FIELDS

The voltage on the conductors of transmission lines generates an electric field in the space between the conductors and the ground. The strength of B2H Project-related electric fields is expressed in units of kilovolts per meter (kV/m), which is equal to 1,000 volts per meter.[13] Most objects, including fences, shrubbery, and buildings, block electric fields. Around transmission lines, measurable electric fields at ground level typically are highest in outdoor areas on the right-of-way cleared of vegetation.

AUDIBLE NOISE

If the B2H Project were implemented, some level of noise would result from construction, maintenance, and operation of the transmission line. During construction, noise would be generated by the equipment used for grading (access roads, tower sites, and series compensation stations), assembly and erection of towers (including helicopter-assisted construction), wire-pulling and splicing, equipment installation, and reclamation activities. During maintenance activities, noise could be generated from a vehicle driving along the access roads for tower and line inspection, a helicopter flying along the right-of-way for tower and line inspection, or equipment, and crew conducting maintenance and/or repairs. Calculation of noise from these activities is complicated by the fact that noise levels continuously rise and fall (e.g., the quantity, distribution, and usage of equipment vary with the type of activity).

Also, at the surface of high-voltage transmission line conductors, the electric field may become concentrated on surface irregularities to cause an electrical breakdown of the insulating properties of the air, resulting in power loss at the site of breakdown (a phenomenon called corona). Corona can result in audible noise, particularly when the surrounding air contains numerous water droplets or snowflakes. If there is sufficient corona activity, audible noise can be noticeable within a few hundred feet of the transmission line. The intensity is most pronounced directly underneath the line conductors and decreases with distance from the transmission line.

Corona activity depends on a number of factors: altitude, line voltage, conductor size, conductor geometry, and weather conditions. Corona activity is most likely to occur near transmission lines at higher altitudes and is most pronounced during foul weather. The breakdown strength of air is 30 kilovolts per centimeter at sea level and decreases with increasing altitude. A transmission line is designed so that at a particular altitude, conductor size, and line voltage, the electric field at the conductor surface does not exceed the breakdown potential. Nevertheless, any irregularities on the conductor surface (e.g., nicks, water droplets, or debris) will create points where the electric field is intensified sufficiently to produce corona. In foul weather, raindrops or snowflakes accumulating on the conductor surface also will act as points for corona inception.

When corona occurs on 500-kV transmission line conductors, it is accompanied by an audible snapping sound. If there is enough corona activity on the line, many small snaps from corona sources along a

[13]The strength of an electric field increases with voltage of the source and decreases with distance from the source. Typical electric field levels in the home and at work are less than 0.1-kV/m. Electric fields within 1 foot of small appliances are in the range of 0.02- to 0.2-kV/m, while the electric field immediately adjacent to the heating wires of some electric blankets can be considerably higher.

conductor may be sufficient, in combination, to produce discernible audible noise (sizzling or crackle) at the edge of the right-of-way.

Sound level is measured in decibels referenced to 20 micropascals, which is approximately the pressure threshold of human hearing at 1 kilohertz (kHz). The range of audible frequencies for the human ear is from approximately 20 Hz to 20 kHz with peak sensitivity near 1 kHz. The change in sensitivity of the human ear with frequency is reflected in measurements by weighting the contribution of sound at different frequencies. Sound at 20 Hz or 20 kHz, where the ear is less sensitive, is given less weight than at frequencies near 1 kHz, where the ear is most sensitive. The weighting of sound over the frequency spectrum to account for the sensitivity of the human ear is called the A-weighted sound level.

When the A-weighted scale is applied to a sound-pressure measurement, the level is often reported as decibels on an A-weighted scale (dBA), referenced to the audible pressure threshold. The sound level of typical human speech is approximately 60 dBA, and background levels of noise in rural and urban environments are about 30 to 40 dBA. Specific identifiable noises such as birdcalls, neighborhood activity, and traffic can produce audible noise levels of 50 to 60 dBA. Table 3-631 lists the sound intensities of common acoustic sources.

Table 3-631. Commonly Encountered Acoustic and Audible Noise Levels

Source	A-weighted sound level (decibel)
Auto horn	110
Inside subway	95
Truck at 50 feet distance	80
Traffic	75
Conversation indoors	65
Office	55
Living room	45
Refrigerator	40
Bedroom	24

Table Source: DOE and BPA 1986; Lee et al. 1996

Corona-generated audible noise varies in time. To account for fluctuating sound levels, statistical descriptors are used to describe environmental noise. Exceedance levels (L levels) refer to the A-weighted sound level that is exceeded for a specified percentage of time. Thus, the L_5 level refers to the noise level that is exceeded only 5 percent of the time. Median sound level (L_{50}) refers to the sound level exceeded 50 percent of the time. Sound-level measurements are expressed in the L_{50} level in fair and foul (steady rain) conditions.

RADIO NOISE

Overhead transmission lines can generate radio noise in the bands used for the reception of radio signals. Two potential mechanisms for interference are gap discharges and corona. Corona activity, described previously as a source of audible noise, also induces impulsive currents along a transmission

line. These induced currents, in turn, cause wide-band radio frequency noise fields that can affect radio and television reception. Radio noise can produce interference to an amplitude-modulated signal such as a commercial radio audio signal (520 to 1,720 kHz). Frequency-modulated radio stations are generally not affected by electromagnetic noise from a transmission line.

In the past, radio noise also could affect the video portion of analog television signals, but this is no longer the case for the majority of television stations. The Digital Television Transition Act authorized by Congress in 1996 determined that full power television stations received an additional broadcast channel to run analog and digital broadcasts simultaneously, and set a deadline of June 12, 2009, for these stations to switch exclusively to digital. The transition date for low power television stations to switch exclusively to digital broadcasting was September 1, 2015.[14] Radio noise from transmission lines is not expected to affect any television broadcasts.

Gap discharges are an intermittent phenomenon that is more common in distribution lines and low-voltage transmission lines. Electrical discharges on these lines can occur where small gaps develop between metallic line hardware (e.g., insulators, clamps, or brackets). Discharge across these gaps can cause incidental interference to radio-communication services; in this event, the sources of gap-type interference can be located and repaired. Gap discharges occur less frequently on high-voltage transmission lines, and the proposed line will be constructed with modern hardware that eliminates gap-type interference.

Radio noise levels are expressed as decibels above 1 microvolt per meter (dBµV/m) to describe the electric field intensity incident on a reference antenna at 500 kHz, as recommended by the IEEE (1971). Weather has a large influence on corona-generated radio noise, as it does for audible noise. As with audible noise, corona-generated radio noise also varies in time. To account for fluctuating noise levels, statistical descriptors are used to describe radio noise. As with audible noise, radio noise levels are expressed as L_{50} values during fair or foul (steady rain) conditions. Radio noise, like audible noise, is more pronounced at higher altitudes.

INTERFERENCE WITH GPS SATELLITE RECEIVERS AND MOBILE PHONES

GPS units, satellite receivers, mobile phones, and community communication systems typically operate at high frequencies in the tens to hundreds of megahertz or even into the gigahertz range. These systems also frequently use FM or digital coding of the signals so that they are relatively immune (superior signal-to-noise ratio) to the electromagnetic interference from transmission line corona.

Mobile phones operate in the radiofrequency range of about 0.8 to 1.9 megahertz or higher frequencies. EMFs at these high frequencies have very different physical characteristics from 60-hertz power frequency EMFs. Due to the frequencies used by these devices and the modulation and processing techniques used, there are no interference effects.

GPS units are used in a wide range of activities including agricultural activities in the study corridor such as monitoring pivot irrigation, tracking wheeled equipment movements during farming operation, and

[14]http://www.fcc.gov/digital-television.

checking the orientation of aerial crop-dusting aircraft. Modern guidance systems have an accuracy of 1 to 2 inches. Comments from local farmers during scoping indicated that power lines can interfere with these GPS guidance systems, making them less accurate, being off from 1.5 to 4.5 feet. If so, inefficiencies could result in wasted fuel, increased labor costs, and under-or over-fertilizing resulting in reduced productivity.

GPS units operate in the frequency range of 1.2 to 1.6 gigahertz. Tests with satellite receivers operating at frequencies from 3.4 gigahertz to 7 gigahertz have shown no effect from transmission lines unless the receiver was trying to view the satellite through the transmission tower or the conductor bundle of the transmission line. Repositioning the receiver by a few feet was sufficient to eliminate the obstruction and reduced signal.

The Applicant reports that they do not specifically track reports of interference with GPS tractor navigation systems. However, in the Magic Valley area of south-central Idaho, these GPS systems are widely used and there are several existing transmission lines up to 500-kV crossing the area. They report that over the last 10 years they have not been contacted about interference with tractor GPS navigation systems. Users of these systems have expressed concerns about the possibility of interference, but no specific examples have been reported (Idaho Power Company 2011). In summary, radio noise from transmission lines does not cause an interference issue with GPS receivers or mobile phones.

Electrical Environment

Analysis for the Final EIS evaluated opportunities for colocation of the B2H Project with other utility corridors (all utilities including transmission lines), see Section 2.1.1.2. NERC requirements regarding separation distances of right-of-way and transmission lines, and some reduction in separation distance, were incorporated in to evaluation of potential for colocation with existing transmission lines. Colocation could occur in Morrow, Union, and Baker Counties. Refer to Table 3-632 for a list of existing ambient levels of radio interference and EMFs where there are no nearby existing transmission lines, as well as where there are existing nearby lines.

Table 3-632. Existing Ambient Levels

Electric Field (kV/m)[1]	Magnetic Field (mG)[2]	Radio Interference dB (1 µV/m)[3,4]
0.1 to 15-kV/m, Earth's static field <0.1-kV/m, AC electric field	500 to 600 mG, Earth's static field <1 mG, AC magnetic field	20 to 55 dB (1 µV/m), depending on season and atmospheric activity

Table Sources:
[1]Chalmers 1967
[2]NOAA 2011
[3]Gilmore et al. 1982
[4]New England Hydro Transmission Corporation 1985.
Table Notes:
AC = alternating current
kV/m = kilovolt per meter
mG = milligauss
dB = decibel.

Existing fields are essentially the static natural electric field of the earth, which is due to atmospheric conditions and can range from a few hundred volts per meter to kilovolts per meter, and the natural magnetic field of the earth, which is in the range of 500 to 600 milligauss; however, both of the fields are essentially static or slowly varying instead of oscillating 60 times per second (60 hertz) like alternating current AC fields associated with a typical AC power lines. Much of the area crossed by the proposed transmission line is open range and cultivated fields. Smaller areas of desert, forest, and scattered residential conditions also exist.

NOISE

Noise is usually expressed in decibels on the A-weighted scale (dBA), which corresponds to how humans hear sound. Depending on the magnitude, duration and amplitude of the noise and the sensitivity and distance of the receptor, the impact may be low or moderate. While the concept of sound is defined by the laws of physics, the perception of sound as noise is influenced by several technical factors, such as intensity, sound quality, tonality, duration, and the existing background levels. It is largely dependent on the magnitude (intensity) or duration of the noise; the distance from the noise source; and the time of day the incidence noise occurs (i.e., higher sensitivities will be expected during the quieter overnight periods).

Depending on local terrain and vegetation conditions, existing general levels of ambient audible noise levels in fair-weather range from 20 to 40 dBA due to air movement through brush and trees. Higher levels of audible noise occur during precipitation events due to the noise of the rain on the ground and local vegetation. Local individual sources, such as animal calls or human activity, also can produce audible noise levels exceeding 60 dBA.

The Applicant conducted an inventory of existing structures along the Draft EIS alternative routes that were potentially noise-sensitive receptors. There were 730 such structures identified within the study corridor. The Applicant conducted ambient sound monitoring at 39 of those structure locations, which were determined to accurately represent the noise-sensitive receptors across the study corridor. The location of the receptors, distance from the right- of-way, receptor types, and measured ambient noise levels at each receptor are presented in Table J-1 in Appendix J.

Existing ambient sound levels are higher near major transportation corridors (i.e., Interstate 84, State Highway 26, and State Routes 203, 237, and 244) and in areas with higher population densities (e.g., Boardman, La Grande). There also are several rural airstrips and small airports in the vicinity, which contribute to ambient noise levels in both surrounding urban and rural areas. The open land, unincorporated areas, and communities crossed by the proposed transmission line are predominantly open land or rural in nature, and are expected to have comparatively lower ambient sound levels. These lands range from very quiet with natural sounds to louder motorized noise from recreational, commercial, and industrial activities. Some meteorological conditions, such as foul weather, are favorable to sound propagation and conducive to corona noise generation that could periodically be audible outside the B2H Project right-of-way. Conversely, corona noise may be partially or fully masked by elevated ambient sound levels generated by rainfall events or ground-level winds. If ambient noise is

very low, even a modest amount of wind can obscure the other noise sources and become the dominant ambient noise, particularly in areas with stands of mature trees.

3.2.18.5 Environmental Consequences

Types of Potential Effects

Noise

Potential audible noise effects include a change to the existing ambient noise levels near the proposed transmission line as a result of construction and operation activities.

Electrical Environment

Potential effects include creation of an electric and magnetic field as a result of electrical current on the conductors of the proposed transmission line. The EMFs would be most notable at ground level within the right-of-way.

No Action Alternative

The B2H Project would not be constructed or operated. The noise environment at the right-of-way and at noise-sensitive receptors would remain unchanged, subject to the effects of other non-B2H Project-related noise sources. In addition, no B2H Project-related changes in the electrical environment would occur.

Effects Common to All Alternatives

Electrical Environment

A computer program developed by the BPA was used to determine expected levels of electric fields, magnetic fields, and radio interference from the B2H Project. Table 3-633 lists the proposed line segments with the characteristics and the peak loadings used for calculation of the magnetic fields.

Table 3-633. Proposed Transmission Lines by County

County	Line Description	Line Status	Type	Loading Peak Current (amps/phase)
Oregon				
Morrow	Single circuit—500-kV	New	Lattice tower	2,500
Umatilla	Single circuit—500-kV	New	Lattice tower	2,500
Union	Single circuit—500-kV	New	Lattice tower	2,500
Baker	Single circuit—500-kV	New	Lattice tower	2,500
Baker	Double circuit—138/69-kV	Rebuilt	Tubular	625/275
Malheur	Single circuit—500-kV	New	Lattice tower	2,500
Idaho				
Owyhee	Single circuit—500-kV	New	Lattice tower	2,500

Table Notes:
amps = amperes
kV = kilovolt

Electric Field

The B2H Project would use three different tower structures: a 500-kV single-circuit lattice structure, delta configuration (Figure 3-8); a 500-kV single-circuit H-frame structure (Figure 3-10); and a 138/69-kV double-circuit single-shaft steel pole (Figure 3-12). When a double-circuit structure is proposed (Figure 3-12) the orientation (phasing) of the conductors in relation to each other would affect the resulting levels of the electric field, magnetic field, and radio interference. Phasing of all conductors of the two circuits is factored in the calculations (Phase Management). The phase of a particular conductor or conductor bundle is indicated as either A, B, or C and the order and phasing of the conductor bundles of a circuit that are used to calculate the electrical levels are indicated as ABC. ABC for a single horizontal circuit indicates that the left conductor bundle is phase A, the middle conductor bundle is phase B, and the right conductor bundle is phase C. CAB would indicate that the left conductor bundle is phase C, the middle conductor bundle is phase A, and the right conductor bundle phase is B.

Electric field profiles for each tower type at midspan were calculated at a 1 meter height aboveground (IEEE Standard 644-1994). The electric field profiles for the three tower types are plotted in Figures 3-9, 3-11, and 3-13; these profiles show the anticipated electric field in and adjacent to the right-of-way. The electric field was calculated at the point of minimum clearance between the lowest conductor and ground. This occurs at midspan for level terrain. The conductor height used for the 500-kV lattice structure lines was 35 feet, 37 feet was used for the 500-kV lines using the H-frame structures, and 34 feet of ground clearance for the 138/69-kV double-circuit configuration. The line height aboveground increases as one moves from midspan back toward the tower, which results in lower electric fields under the line. The electric field was calculated with a 10 percent overvoltage for 500-kV and 138/69-kV lines.

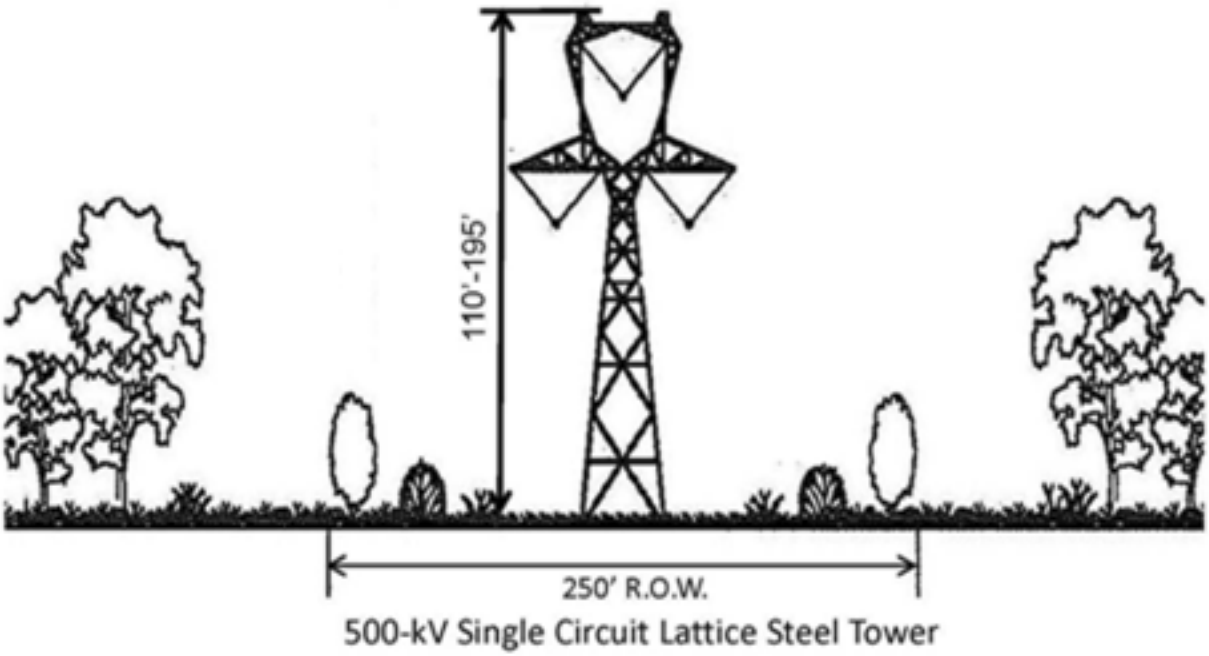

Figure 3-8. 500-kV Single-Circuit Lattice Steel Structure

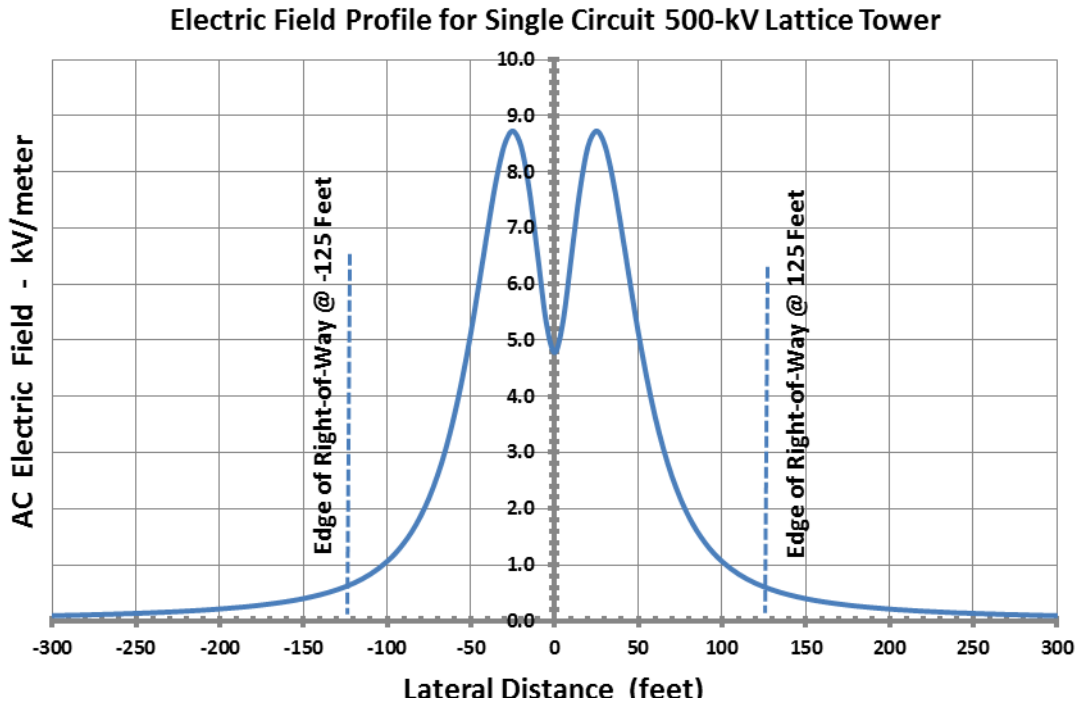

Figure 3-9. Electric Field Profile at Midspan for 500-kV Lattice Structure

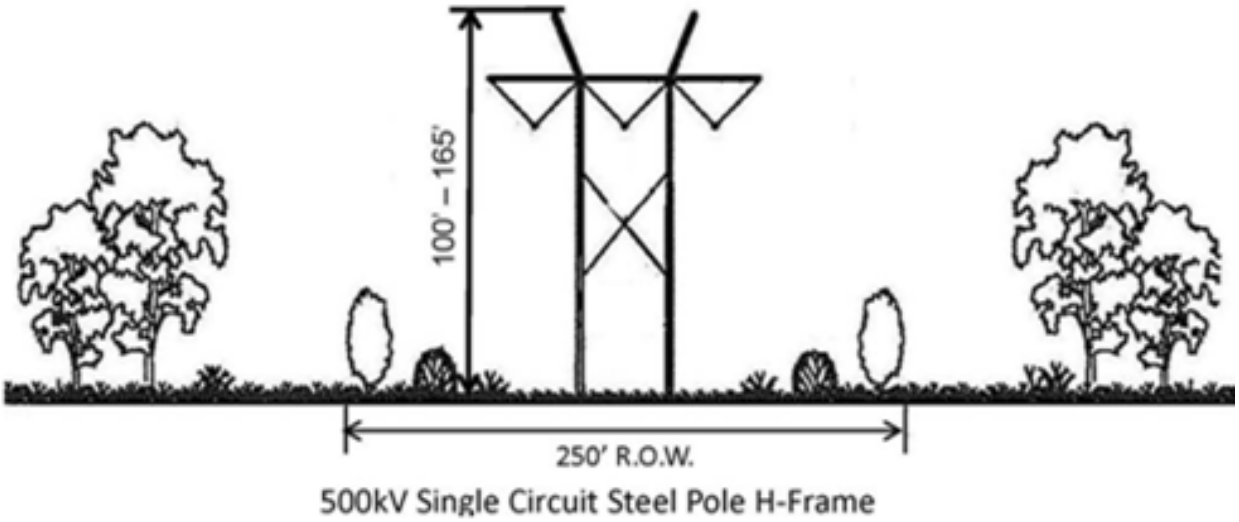

Figure 3-10. 500-kV Single-Circuit Steel Pole H-Frame Structures

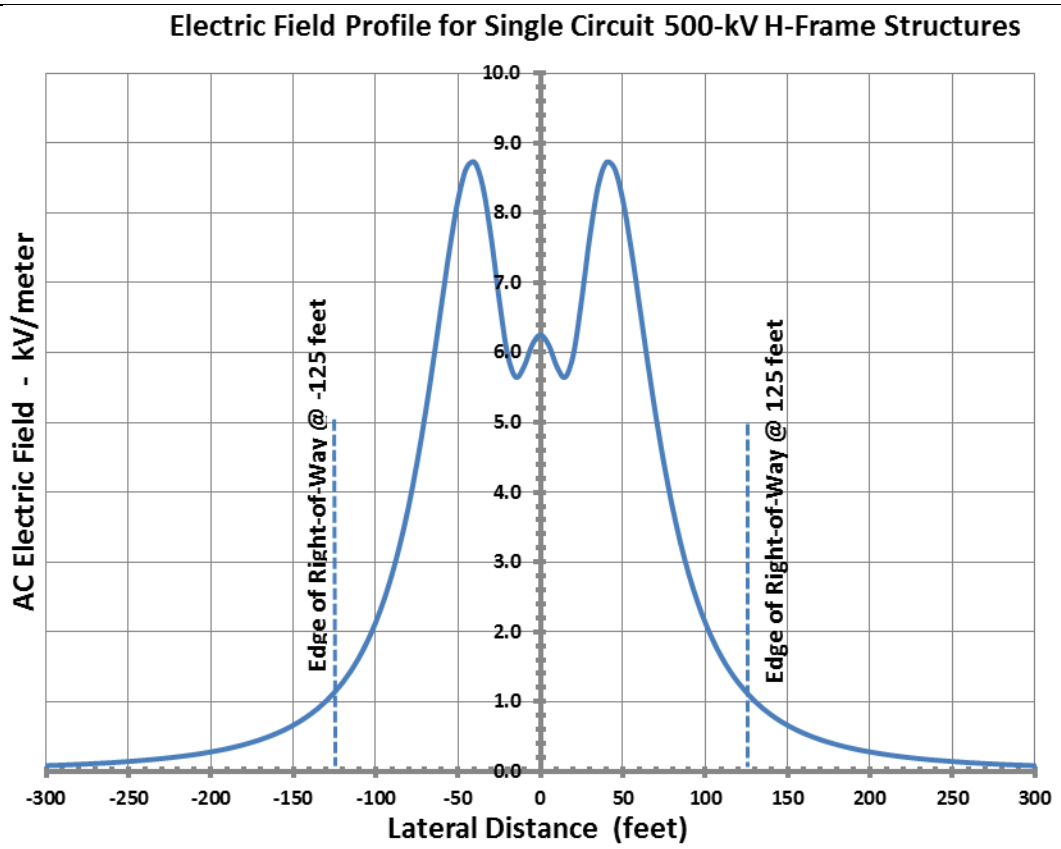

Figure 3-11. Electric Field Profile at Midspan for 500-kV Single-Circuit H-Frame Structure

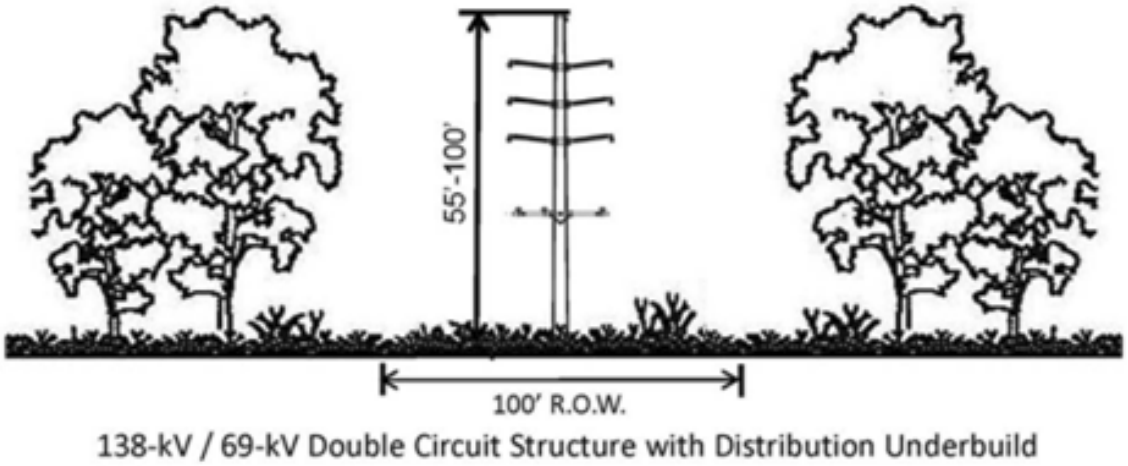

Figure 3-12. 138/69-kV Double-Circuit Tubular Steel Pole

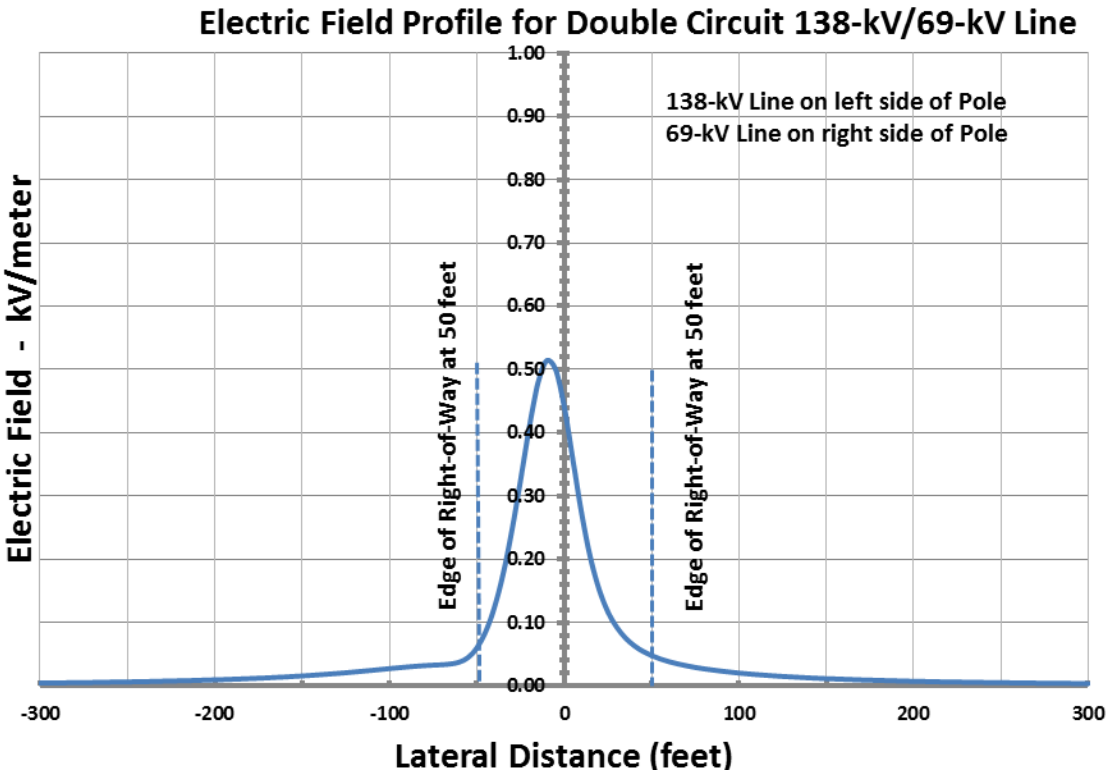

Figure 3-13. Electric Field Profile at Midspan for Double-Circuit 138/69-kV Single-Circuit Steel Pole Structure

The maximum modeled electric field within the right-of-way and at the edges of the right-of-way of the proposed B2H Project and alternatives is within the standards of the states. These include standards for high-voltage transmission lines, within BPA's guidelines for new transmission lines, and within the international guidelines summarized in Table 3-630.

Table 3-634. Electric Fields within and at Edges of Right-of-Way

Portion of Route[1]	Right-of-Way Width (feet)	Right-of-Way Edge (kV/m)	Maximum within Right-of-Way (kV/m)
Morrow County (500-kV)	250	0.61	8.73
Umatilla County (500-kV)	250	0.61	8.73
Union County (500-kV)	250	0.61	8.73
Baker County (500-kV)	250	0.61	8.73
Baker County (138/69-kV)	100	0.06	0.51
Malheur County (500-kV)	250	0.61	8.73
Owyhee County (500-kV)	250	0.61	8.73
Tubular H-frame (500-kV)	250	1.13	8.72

Table Notes:
[1]Ground clearance: 35 feet for 500-kV lines with lattice tower structures; 37 feet for 500-kV lines with tubular H- frame structures; and 34 feet for 138/69-kV lines with single tubular poles structures.
kV = kilovolt
kV/m = kilovolt per meter
RMS Resultant Electric Field at standard height of 1 meter in accordance with IEEE Standard 644-1994.

The B2H Project is designed so that expected levels of EMFs and radio noise as measured will be below accepted guidelines at the edge of the proposed rights-of-way (Table 3-634). The maximum modeled electric field within the right-of-way and at the edges of the right-of-way of the B2H Project is within Oregon standards for high-voltage transmission lines, within BPA's guidelines for new transmission lines, and within the international guidelines summarized previously. If an alternative route along Bombing Range Road is selected, different tower types may be used in order to comply with the Navy's requests described in Section 2.8.1. of this document. Use of alternative tower types would also comply with the Oregon standards for high-voltage transmission lines. There are no established high-voltage transmission line standards for Idaho.

Magnetic Field

The resultant magnetic field profiles at midspan (point of closest approach of conductors to ground) were calculated for the three line types and are plotted in Figures 3-14, 3-15, and 3-16. The magnetic fields at the edges of the rights-of-way and the highest magnetic field found within the right-of- way for each of the line segments in the B2H Project are listed in Table 3-635. There are no established magnetic field standards for Idaho. The highest value of magnetic field calculated at the edge of the right-of-way was 68.3 milligauss, and this level was found where the 500-kV tubular H- frame structure is used. The highest magnetic field found within the right-of-way was 440 milligauss for the rights-of-way containing the 500-kV tubular H-frame structures. Table 3-635 provides expected levels of the magnetic field at various locations along the Proposed Action.

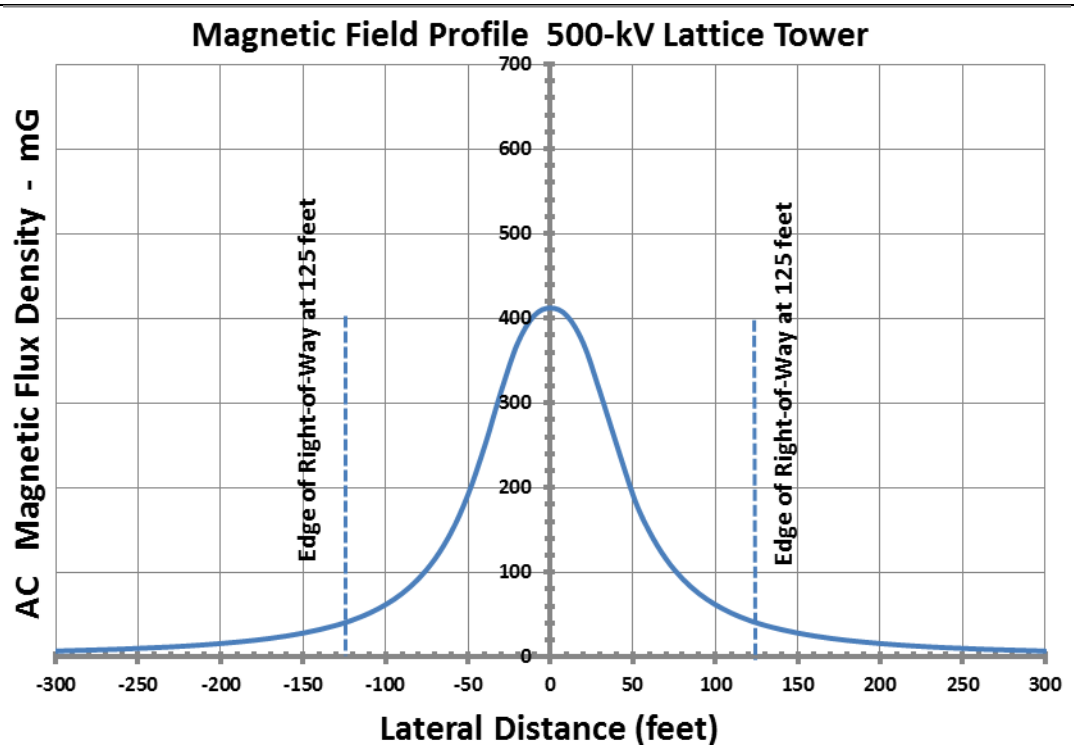

Figure 3-14. Magnetic Field Profile at Midspan for 500-kV Single-Circuit Lattice Structure

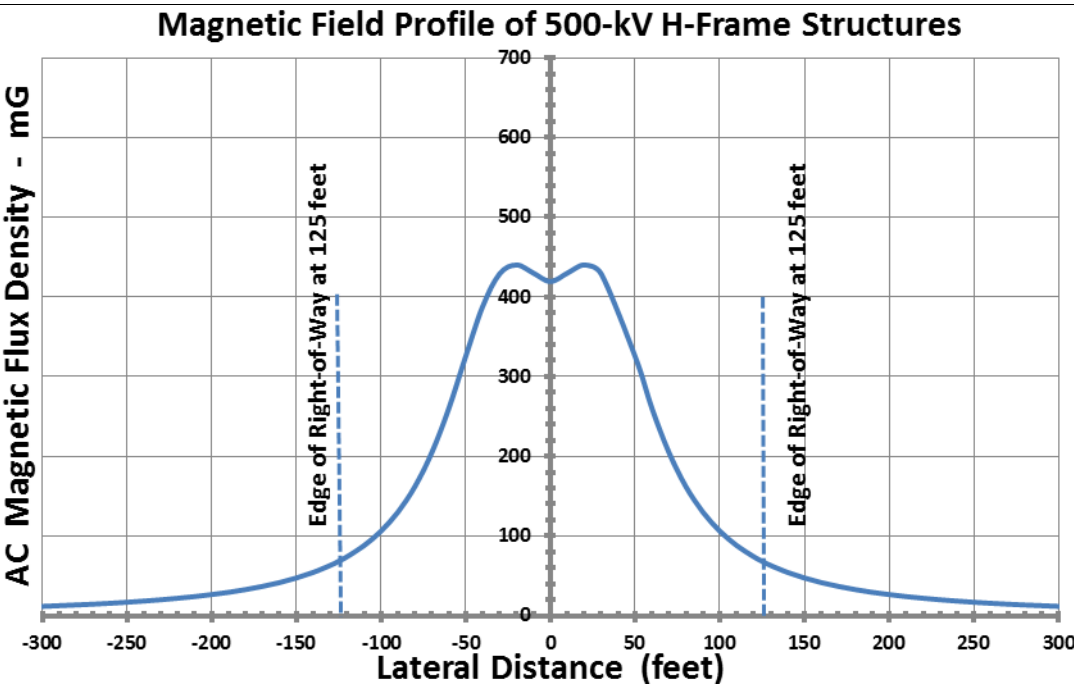

Figure 3-15. Magnetic Field Profile at Midspan for 500-kV Single-Circuit Tubular H-Frame Structure

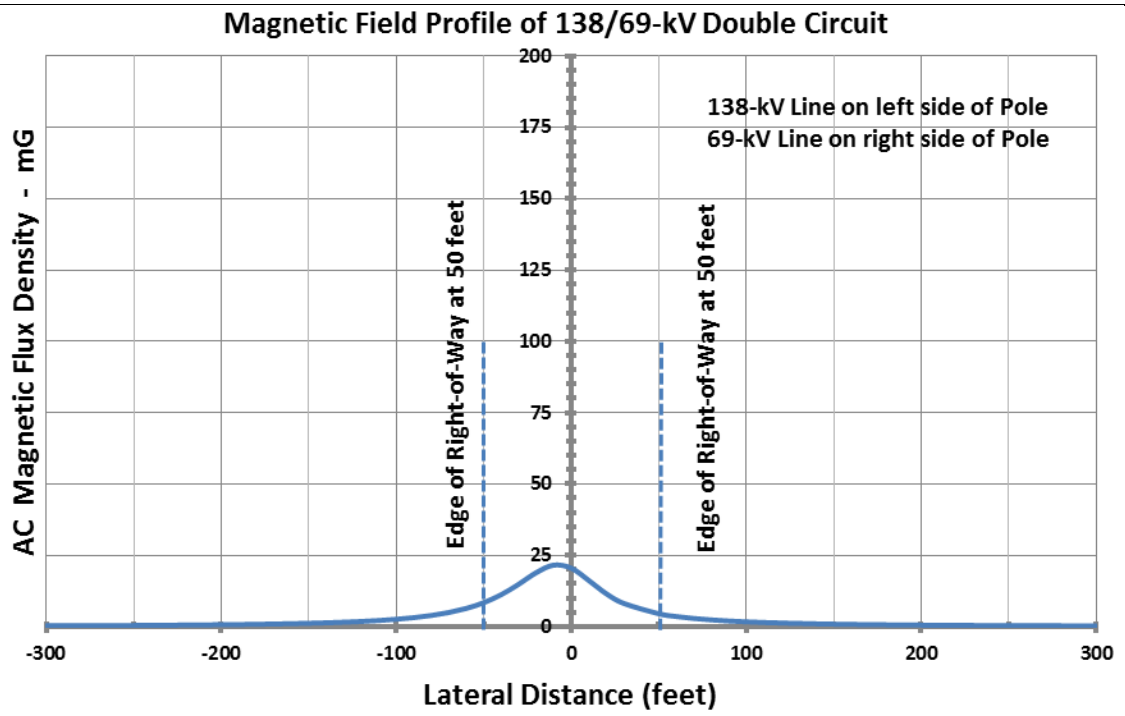

Figure 3-16. Magnetic Field Profile at Midspan for 138/69-kV Double-Circuit Tubular Pole Structure

Table 3-635. Magnetic Fields (Peak Loading)

Portion of Route[1,2]	Right-of-Way Width (feet)	South/East Right-of-Way Edge (mG)	Maximum within Right-of-Way (mG)	North/West Right-of-Way Edge (mG)
Morrow County (500-kV)	250	40.4	412	40.4
Umatilla County (500-kV)	250	40.4	412	40.4
Union County (500-kV)	250	40.4	412	40.4
Baker County (500-kV)	250	40.4	412	40.4
Baker County (138/69-kV)	100	8.4	21.5	4.5
Malheur County (500-kV)	250	40.4	412	40.4
Owyhee County (500-kV)	250	40.4	412	40.4
Tubular H-frame (500-kV)	250	68.3	440	68.3

Table Notes:
[1]Peak loading: 2,500 amps/phase for 500-kV lines; 625 amps/phase for 138-kV line; 275 amps/phase for 69 - kV line
[2]Ground clearance criteria: 35 feet for 500-kV lattice structure lines; 37 feet for 500-kV tubular H-frame structures; and 34 feet for 138/69-kV single tubular poles.
kV = kilovolt
mG = milligaus
RMF = Resultant Magnetic Field at standard height of 1 meter

Electric and Magnetic Field Effects

The EMFs created by power transmission lines can create short-term effects, generally perceived as nuisances such as induced currents or shocks.

Field Induction (Induced Currents and Nuisance Shocks)

The electric fields associated with a transmission lines can cause voltages and/or currents to be induced (capacitive coupling) on otherwise un-energized conductive objects. Metallic roofs, vehicles, equipment, and fences are examples of objects that can develop a small electric charge when in proximity to high-voltage transmission lines. The induced voltage is a function of the transmission line voltage, the height of conductors, insulation between the object and ground, the characteristics and size of the object, and the electric field strength. An electric current can flow when an object has an induced charge and a path to ground. The induced voltage produces a short-circuit current. The amount of induced current that can flow is important for evaluating the potential for nuisance shocks to people and the possibility of other effects such as fuel ignition.

Transmission line electric fields also can induce voltages and currents on people who are in the area or on a high-voltage transmission line right-of-way. The magnitude of the induced voltage is a function of the line voltage, line geometry, the location of the person within the source electric field and the height and size of the individual. When the individual comes in contact with a grounded object, a short-circuit current will flow. This short-circuit current or spark discharge may be described as an annoying or nuisance shock. These occasions can be characterized as similar to the “static shock” a person could receive from walking on a carpet during a dry weather period, and touching a grounded object. A notable difference is the AC induced voltages from transmission lines spark discharges can be recurring or continuous (EPRI 1982).

The threshold of perception of an electric current is approximately 1 milliampere for humans (Dalziel and Mansfield 1950). If the current is increased sufficiently beyond a person’s perception threshold, it can become bothersome and possibly startling. Larger currents can cause the muscles of the arm and hand to involuntarily contract so that a person cannot let go of an object. The value at which 99.5 percent of men, women, and children can still let go of an object is approximately 9, 6, and 5 milliamperes, respectively. The National Electric Safety Code (2012) addresses this issue, limiting the steady-state current that can flow between an object and the earth near a transmission line to 5 milliamperes. This is considered to be a safe level.

Transmission lines are designed such that the maximum amount of current induced on the largest metallic object normally expected under the line would be less than 5 milliamperes. Nuisance shocks and induced currents can be eliminated by proper grounding of the object, shielding it from electric fields, or positioning it farther from the transmission line.

Although transmission lines are designed to limit induced currents on objects underneath the lines to a safe level, this level of current or the contact electric shock may still occur and be perceived when an object is contacted. This may be considered a nuisance depending on the magnitude of the current or shock. The peak electric field found under the 500-kV lines is sufficient that currents and potentials induced on vehicles and farm equipment operated within the right-of-way might be perceived. Most of the area under the B2H Project lines has lower fields and only a small area under the 500-kV lines where the conductors come closest to ground near midspan would be likely to induce perceivable currents or potentials on conductive objects such as vehicles or farm equipment.

The relation between short-circuit current and electric field for several vehicles and agriculture-related pieces of equipment has been measured and is listed in Table 3-636 (EPRI 1982). Multiplying the factors listed in Table 3-636 by the electric field yields the short-circuit current expected under conditions that are expected to produce the greatest magnitude short-circuit currents. The highest electric field calculated within the Proposed Action right-of-way and alternatives for the proposed 500-kV lines was 8.73-kV/m. The vehicles and equipment listed in Table 3-636 would have short-circuit currents that are less than the 5-milliampere current required by the National Electric Safety Code (2012) except for the tractor-semitrailer where the induced current would be 5.6 milliamperes if the entire length of the tractor-semitrailer were in a 8.73-kV/m electric field (e.g., parallel to the line). Tractor-semitrailers would generally not be anticipated under the line except at line road crossings. At locations where large vehicles are anticipated, the line height would be increased as needed (or the line design altered) so that the line complies with the 5-milliampere requirement of National Electric Safety Code Section 23 rules (2012).Appropriate design practices for the B2H Project, proper ground clearances, and acceptable electric field values on and at the edge of the right-of-way minimize electric field induction problems. In addition, proper grounding practices for conductive objects on and at the edge of right-of-way would reduce annoying and nuisance shocks.

Table 3-636. Induced Current Factors

Object	Induced Current Coefficient ISC/E (mA per kV/m)
Car (L 4.6m x W 1.78 m x H 1.37 m)	0.088
Pickup truck (L 5.2 m x W 2.0 m x H 1.7m)	0.10
Tractor-semitrailer (40-foot trailer) (L 15.75 m x W 2.4 m x H 3.7m)	0.64
Farm tractor pulling crop wagon (9.55-m total length)	0.30

Table Notes:
E = alternating current electric field
L = length
mA/kV = milliampere per kilovolt W = width
H = height
ISC = short-circuit current

Radio Interference

Radio interference occurs when the 60-hertz electric fields at the surface of a power line conductor (conductor surface gradient) is above a certain critical value to cause a local breakdown in the insulating properties of the air. This electrical breakdown of the air or ionization of the air, at the surface of the conductor is called a *corona*. Corona discharges in general can produce electromagnetic interference to radio and TV reception. If there is sufficient corona activity, radio and TV interference can be noticeable within a few hundred feet of the transmission line, and small amounts of ozone and nitrous oxide can be released. These effects are most pronounced directly underneath the line conductors and decrease with distance from the transmission line.

Figures 3-17, 3-18, and 3-19 show the anticipated radio interference profiles at mid span (conductor closest to the ground) for the 500-kV lattice towers, 500-kV H-frame towers, and the 138/69-kV transmission line.

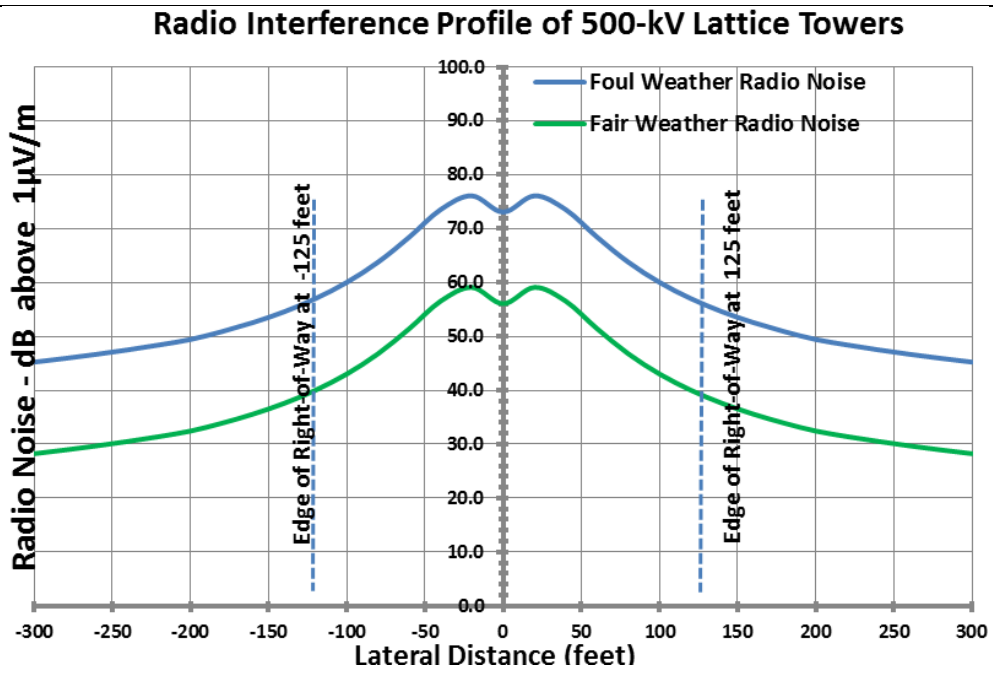

Figure 3-17. Radio Noise Profile at Midspan for 500-kV Single-Circuit Lattice Structure

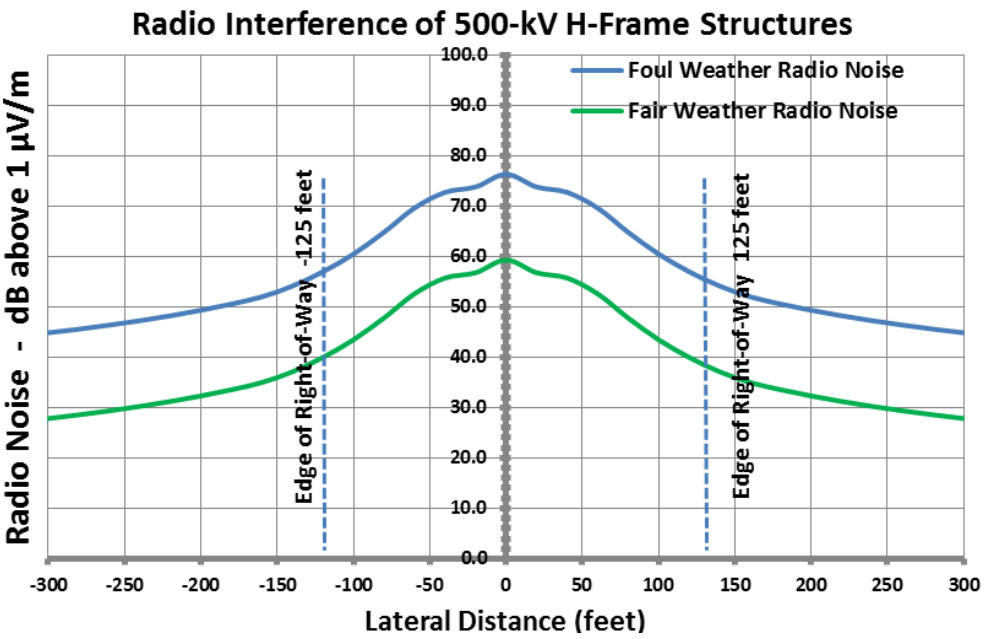

Figure 3-18. Radio Noise Profile at Midspan for Single-Circuit 500-kV Tubular H-Frame

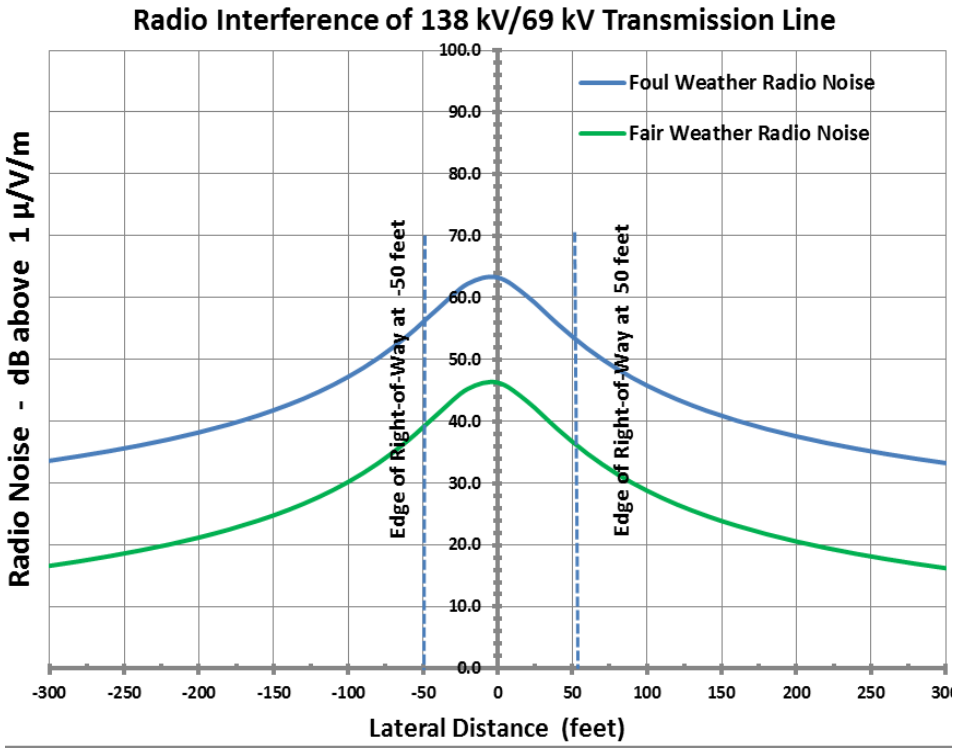

Figure 3-19. Radio Noise Profile at Midspan for 138/69-kV Transmission Line

The impulsive corona activity can cause wide-band electric and radio interference. This radio interference spans the frequency spectrum from below 100 kilohertz to approximately 1,000 megahertz. Inclement weather and high altitude increase radio interference levels. This activity from transmission lines can produce electromagnetic interference to an AM broadcast band (535–1605 kilohertz) signal such as a commercial AM radio audio signal. FM radio stations and the audio portion of a TV station signal (which also is frequency modulated) are generally not affected by interference from a transmission line. Radio interference is measured in decibels based on its field strength referenced to a signal level of 1 microvolt per meter. Existing ambient levels of radio noise are created by atmospheric activity and are approximately at 30 to 40 decibels (dB) (1 microvolt per meter in fair weather at 1 megahertz), depending on the season and amount of storm activity. Radio interference resulting from operation of the B2H Project is anticipated to be low and can be remedied by the Applicant using Design Feature 27 as a mitigation measure on a case-by-case basis.

Audible Noise

Transmission line construction and operation would periodically generate audible noise levels. Additional noise sources may include commuting workers and trucks moving material to and from the work sites. The construction equipment that would be used is similar to that used during typical public works projects and tree service operations (e.g., road resurfacing, storm-sewer installation, natural gas line installation, tree removal, etc.). Transmission line construction would occur sequentially, moving along the length of the B2H Project route, or in other areas such as near access roads, structure sites, conductor pulling sites, and staging and maintenance areas (Jackson et al. 1994). Overhead line

construction is typically completed in the following stages, but various construction activities may overlap with multiple construction crews operating simultaneously:

- Site access, road construction, and preparation
- Installation of structure foundations
- Erecting of support structures
- Stringing of conductors, shield wire, and fiber-optic ground wire

Noise levels from overhead transmission line construction were evaluated using a screening-level, distance from the right-of-way analysis approach. The calculation methodology required the input of the number and type of construction equipment by phase, as well as a typical noise-source level associated with that equipment, to determine the composite sound levels for standard distances of 50 and 1,000 feet. Table 3-637 below indicates the general level of noise associated with each construction phase.

Table 3-637. Noise Levels by Transmission Line Construction Phase

Example Construction Equipment	Equipment Noise Level at 15 meters (50 feet), dBA	Composite Noise Level at 15 meters (50 feet), dBA	Composite L_{eq} Noise Level at 305 meters (1,000 feet), dBA
Construction Phase 1: Site Access and Preparation			
Bulldozer	86	85	51
Grader	82		
Roller—compactor	73		
Loader	78		
Water truck	80		
Dump truck	80		
Construction Phase 2: Installation of Structure Foundations			
Bulldozer	86	91	56
Loader	78		
Backhoe-loader	80		
Fork lift	80		
Mobile crane	82		
Mobile crane	82		
Auger rig	85		
Drill rig	87		
Compressor	81		
Pump	83		
Portable mixer	82		
Jackhammer	90		
Cement mixer truck	80		
Dump truck	80		
Slurry truck	80		
Specialty truck	75		
Water truck	80		

Table 3-637. Noise Levels by Transmission Line Construction Phase			
Example Construction Equipment	**Equipment Noise Level at 15 meters (50 feet), dBA**	**Composite Noise Level at 15 meters (50 feet), dBA**	**Composite L_{eq} Noise Level at 305 meters (1,000 feet), dBA**
Construction Phase 3: Erecting of Support Structures			
Forklift	80	95	60
Mobile crane	82		
Compressor	81		
Flatbed truck	75		
Flatbed truck	75		
Water truck	80		
Heavy lift helicopter	95		
Construction Phase 4: Stringing of Conductors, Shield Wire, and Fiber-Optic Ground Wire			
Tracked dozer	86	86	52
Backhoe-loader	80		
Compressor	81		
Line puller	81		
Mixed trucks	80		
Specialty truck	75		
Specialty truck	75		
Water truck	80		
Table Source: Title 23 CFR Part 772 (Procedures for Abatement of Highway Traffic Noise and Construction Noise); FHWA 2006; Bolt, Beranek, and Newman, Inc. 1977.			
Table Notes: dBA = A-weighted decibels L_{eq} = equivalent sound level.			

The noise impacts at specific noise-sensitive receptors from construction will depend on the type of equipment used, the mode of equipment operation, the length of time the equipment is in use, the amount of equipment used simultaneously, and the distance between the sound source and the receptor. These factors are expected to vary throughout the construction period, making the calculation of a specific received sound-level value at each receptor location difficult. Construction in the proximity of any single location would likely last a few days to several weeks, as construction activities move along the corridor. As a result, no single receptor would be exposed to elevated noise levels or vibrations for an extended period. Construction equipment would be operated on an as-needed basis during this period.

Construction activities would occur for limited lengths of daytime hours as established by municipal bylaws or as specified under local zoning codes to minimize impacts at noise-sensitive receptors. In addition, the majority of construction activities would occur away from population centers; therefore, the potential for construction activities to result in temporary or periodic increases in ambient noise levels in the acoustic environment would be low.

The Applicant will comply with established noise ordinances and suggested noise guidelines to reduce the potential for adverse noise impacts at noise-sensitive receptors. To minimize noise impacts on

sensitive receptors, the Applicant will identify and provide a public liaison, prior to and during construction, to respond to concerns about construction noise. In addition, the Applicant will establish a toll-free hotline to receive questions or complaints and develop procedures to respond to callers.

The noise effects of construction of the proposed B2H Project would depend on the location of noise receptors with regard to the locations of the construction activities and a number of other variables. Proximity to the B2H Project right-of-way provides a broad generalization of the potential for construction noise effects. For the majority of the right-of-way, construction of the B2H Project would result in short-term, low adverse noise effects because of small number of noise-sensitive receptors in proximity (i.e., within 1,000 feet) along these portions of the right-of-way, and the temporary and localized nature of noise that would be generated during the construction phase.

Noise effects from operation phase of the Proposed Action and all the alternatives are anticipated to be low. Results of similar 500-kV transmission line EIS analyses (i.e., recent BPA studies in 2016 [BPA 2016], West-Wide Energy Corridor EIS [DOE and BLM 2008]) support the conclusion that noise effects of the operation of the Proposed Action and the alternatives are anticipated to be low or indiscernible.

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3.2.19 INTENTIONAL ACTS OF DESTRUCTION

Intentional acts of destruction, that is, acts of sabotage, terrorism, vandalism, and theft, sometimes occur at power utility facilities. Vandalism and theft are most common, especially of metal and other materials that can be sold. However, given the extensive security measures that public and private utilities, energy-resource developers, and federal agencies, such as the Department of Homeland Security, have and are continuing to implement to help prevent such acts and protect their facilities, along with the inherent difficulty in significantly affecting such large and well-constructed facilities as transmission line structures and substation sites, it is considered extremely remote and unlikely that a significant terrorist or sabotage act would occur.

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3.3 CUMULATIVE EFFECTS

This section addresses the cumulative effects associated with the B2H Project that would result when combined with other past, present, and reasonably foreseeable future actions. The following discussion includes a general definition of cumulative effects, cumulative effects analysis methodology, past, present and reasonably foreseeable future actions, and the results of the assessment of cumulative effects by resource. The analysis of cumulative effects by resource includes past, present, and reasonably foreseeable future actions (RFFAs) and the incremental impacts of the B2H Project.

3.3.1 DEFINITION

Cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the impact on the environment which results from the incremental impact of the action when added to other past and present actions and other RFFAs, regardless of what agency (federal or non-federal) or person undertakes such actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). Further the BLM Handbook (1790-1) states that “the purpose of cumulative effects analysis is to ensure that federal decision-makers consider the full range of consequences of actions (the Proposed Action and alternatives, including the No Action Alternative).”

3.3.2 METHODS

The identification of issues for analysis in the EIS is discussed in Section 1.6.3. The issues determined to potentially involve a cumulative effect with other past and present actions or RFFAs are included in the cumulative effects analysis. An exception is if the B2H Project would have no direct or indirect effects on a resource, would not contribute incrementally to cumulative effects, and is not included in the analysis for that resource.

The resource-specific criteria for determining the intensity of an impact on a resource that are presented in Section 3.2 apply to cumulative effects.

3.3.2.1 GEOGRAPHIC AND TEMPORAL SCOPE OF ANALYSIS

The cumulative impact analysis area (CIAA) varies by resource because the extent of direct and indirect effects of the B2H Project would vary by resource. Table 3-638 shows the CIAAs for resources affected by the B2H Project. In some cases, the cumulative effects analysis area for a resource is larger than the project-specific analysis area to consider an area large enough to encompass likely effects from other projects on the same resource.

The temporal scope is established by the time frame for a cumulative effects issue—that is, the duration of short-term and long-term effects anticipated. Together, the geographic and temporal scopes make up the CIAA.

In this analysis, temporary environmental effects predicted to occur during construction of the B2H Project that would be anticipated to return to a preconstruction condition at or within 5 years of the end

of construction were considered short-term impacts. Environmental effects that would be anticipated to remain for the life of the B2H Project (approximately 50 years), were considered long-term impacts. Permanent impacts are those that would be anticipated to endure beyond the life of the B2H Project.

3.3.2.2 CUMULATIVE ACTIONS

In general, a cumulative action is a past, present, or other proposed action or RFFA that potentially has a cumulatively significant impact when combined with the Proposed Action. For purposes of this analysis, RFFAs are proposed projects or actions that have either applied for a permit from local, state, or federal authorities or which are publicly known. Table 3-639 and Table 3-640 list known current and future projects and RFFAs located in or near the B2H Project area, which were incorporated into the analysis of cumulative effects. Past and present actions and RFFAs also are shown on MV-27.

PAST AND PRESENT ACTIONS

Past and present actions have contributed to the affected environment or the context of the proposed B2H Project and are described in this section. Table 3-639 lists the types of past and present projects and actions that could create cumulative effects with the B2H Project effects. Refer also to MV-27.

The following subsections characterize the types of past and present projects occurring in the CIAA for the B2H Project.

EXISTING AGRICULTURAL OPERATIONS

Agricultural operations in the cumulative impact analysis include irrigated and dryland farming including tree farming, timber management and grazing. Refer to Section 3.2.7 and 3.3.3.7 for additional detail regarding existing conditions for Agriculture and Land Use.

Irrigated and Dryland Agriculture

During the period 1973 through 2000, dryland farming areas in the Columbia Plateau Ecoregion (Segment 1 of the B2H Project) were being converted to irrigated agriculture, although the total area under agricultural production grew only about 0.6 percent during the 1990s (Sleeter et al. 2012). Areas of irrigated and dryland agriculture remained essentially stable over the same period in the Blue Mountains Ecoregion (Segment 2), the Northern Great Basin Ecoregion (Segments 3, 4 and 5), and the Snake River Plain Ecoregion (Segment 6) (Sleeter et al. 2012).

Timber Management

Within the CIAA, the most frequent land use and cover conversions during the 1973 to 2000 time period were the mechanical disturbance of forest by logging and rangeland improvement (generally removal of pinion/juniper vegetation to promote conversion to grasslands) in the Blue Mountains Ecoregion (Segments 2 and 3). The second most common overall conversion was nonmechanical disturbance of forest by fire and to a significantly lesser degree, to insect damage from the Douglas-fir tussock moth, the western spruce budworm and the mountain pine beetle (Sleeter et al. 2012).

Table 3-638. Cumulative Impact Analysis Areas by Resource		
Resource	**Cumulative Impact Analysis Area**	**Rationale for Area**
Earth Resources		
Soils	Sensitive soil areas within 0.5 mile of the alternative route centerline (one mile buffer).	Direct and indirect impacts on soils would be restricted to areas within and adjacent to the B2H Project disturbed areas.
Minerals Resource Extraction	Areas of active resource extraction for minerals, oil, and gas that are crossed by alternative routes within 0.5 mile of alternative route centerline (one mile buffer).	Direct and indirect impacts on mining of minerals and oil and gas extraction operations would be limited to areas crossed by B2H Project infrastructure. Effects on the states' mineral and oil and gas industries are discussed in Social and Economic Conditions.
Paleontology	Areas within 0.5 mile of areas with potential fossil yield (PCF) of 1 through 4.	Direct and indirect effects would be limited to the outcrop areas of formations with potential fossil yield of 1 through 4.
Water Resources		
Streams and Wetlands	Subwatersheds (12-digit HUCs) that intersect the centerline.	Impacts from the B2H Project may affect areas lower in the watershed. All projects in the watershed need to be considered for effects on water quality.
Vegetation Resources		
Vegetation Communities	Subwatersheds (12-digit HUCs) that intersect the centerline.	Impacts from the B2H Project may affect areas lower in the watershed. All projects in the watershed need to be considered for effects on vegetation.
Wildlife Resources		
Elk, mule deer, and pronghorn winter range	Polygons crossed by centerline, within the B2H Project area boundary	Area of potential critical stress for big game populations.
Bighorn Sheep Oregon Occupied Range	Polygons crossed by centerline, within the B2H Project area boundary	Area of potential critical stress for big game populations.
Columbia spotted frog	Potentially occupied and suitable habitat within 0.5 mile (one mile buffer) of the alternative route centerlines	Direct and indirect effects would occur near the B2H Project footprint.
Greater Sage-Grouse	Priority Habitat Management Areas, General Habitat Management Areas, and Important Habitat Management Areas polygons within 11 miles of alternative route centerlines	Sage-grouse that attend leks up to 18 kilometers (11 miles) from the B2H Project may be indirectly affected by the loss of habitat functionality during other seasons of the year (Connelly et al. 2000).
Washington ground squirrel	Polygons crossed by centerline, within the B2H Project area boundary for occupied colony avoidance and dispersal areas; 5-mile buffer for suitable habitat.	Direct and indirect effects would occur near the B2H Project footprint. Potential habitat for affected animals would be within 5 miles of the B2H Project centerlines.

Table 3-638. Cumulative Impact Analysis Areas by Resource		
Resource	**Cumulative Impact Analysis Area**	**Rationale for Area**
Fish		
Bulltrout, Middle Columbia River Steelhead, Chinook Salmon, and Snake River Basin Steelhead Critical Habitat; Redband Trout Occupied Streams; and Chinook Salmon Essential Fish Habitat	Subwatersheds (12-digit HUCs) that intersect the centerline	Impacts from the B2H Project may affect areas lower in the watershed. All projects in the watershed need to be considered for effects on water quality in fish habitat.
Land Use		
Special Designations	Proposed Areas of Critical Environmental Concern, Research Natural Area and Wildlife Management Area boundaries that intersect the right-of-way	Level at which land-use regulations, plans, or authorizations are in effect.
Agriculture		
Agriculture – Irrigated Agriculture	The full extent of all irrigated agriculture polygons that intersect the B2H Project right-of-way.	Direct and indirect effects on irrigated agriculture would occur near the B2H Project footprint within the analysis area.
Agriculture – Tree farms	The full extent of all tree farm polygons that intersect the B2H Project right-of-way.	Direct and indirect effects on tree farms would occur near the B2H Project footprint within the analysis area.
Agriculture – CAFOs	The full extent of all CAFO boundaries that intersect the B2H Project right-of-way.	Direct and indirect effects on agricultural operations would occur near the B2H Project footprint within the analysis area.
Agriculture – Crop Production	The full extent of all crop polygons that intersect the B2H Project right-of-way.	Direct and indirect effects on crop production would occur near the B2H Project footprint within the analysis area.
Agriculture – Important Farmland and High-value Soils	The full extent of all important farmland and high-value soil polygons that intersect the B2H Project right-of-way.	Direct and indirect effects on important farmland and high-value soils would occur near the B2H Project footprint within the analysis area.
Agriculture – Grazing	The full extent of all allotment boundaries that intersect the B2H Project right-of-way.	Direct and indirect effects on grazing allotments could occur out to the extent of grazing allotments crossed by the B2H Project right-of-way.
Recreation		
Recreation	The full extent of any hunting area, recreation area/site, and state park boundary that intersects the B2H Project right-of-way.	Level at which land-use regulations, plans, or authorizations are in effect.

Table 3-638. Cumulative Impact Analysis Areas by Resource		
Resource	**Cumulative Impact Analysis Area**	**Rationale for Area**
Transportation		
Transportation	Air: Airports within 3 miles of the alternative routes and access roads. Roads: Transportation facilities within the 2-mile wide study corridor (one mile from centerline of alternative routes).	Airport distance defined by controlled airspace; estimated extent of conflicts associated with transportation for the B2H Project, other past and present projects, and RFFAs.
Lands with Wilderness Characteristics		
Lands with Wilderness Characteristics	The full extent of any lands with wilderness characteristics unit boundary that intersects the B2H Project right-of-way.	Level at which land-use regulations, plans, or authorizations are in effect.
Potential Congressional Designations		
Potential Congressional designated areas	Boundary of potential congressional designated areas, including wilderness areas, inventoried roadless areas, National Historic Trails, and Wild and Scenic Rivers crossed by alternative routes.	Level at which land-use regulations, plans, or authorizations are in effect.
Visual Resources		
Visual Resources	Scenic Quality: B2H Project VAUs, expanded to represent complete landscape units, located within 5 miles of the B2H Project. Sensitive viewing platforms: Defined by the area located within 10 miles of agency-approved KOP locations.	Although views can and do extend beyond 10 miles, the 10-mile distance was chosen because it is near the limit of visibility of skylined transmission towers that may be noticeable to casual observers and beyond that the Proposed Action and alternatives would have negligible, if any, contribution to cumulative visual resources impacts.
Cultural Resources		
Cultural Resources	Area for direct cumulative impact analysis extends 250 feet on either side of the reference centerline. Area for indirect cumulative impact analysis is defined as 5 miles on either side of the transmission center line or the visual horizon, whichever is closer, based on the area of potential effects (APE) established in the project programmatic agreement.	Area where direct cumulative impacts associated with use of right-of-way and/or access roads could occur includes the proposed maximum right-of-way width (500 feet) and a buffer for direct effects and the area from which the B2H Project could be viewed for visual impacts. Area where indirect cumulative impacts stemming from construction and operation of the facility is defined as the viewshed from historic properties in which setting, feeling and association are key aspects of integrity. The B2H Project APE establishes that area.

Table 3-638. Cumulative Impact Analysis Areas by Resource		
Resource	**Cumulative Impact Analysis Area**	**Rationale for Area**
National Historic Trails		
National Historic Trails	The area within 10 miles from the B2H Project was used to identify past, present, and future actions, while the detail analysis focused on the area within 5 miles of trail management components to quantify cumulative effects in a manner consistent with the B2H Project impact methodology.	Although views can and do extend beyond 10 miles, the 10-mile distance was chosen because it is near the limit of visibility of skylined transmission towers that may be noticeable to casual observers and beyond that the alternative routes would have negligible, if any, contribution to cumulative impacts on the National Historic Trails and Study Trails.
Air Quality and Climate Change		
Air Quality and Climate Change	Air quality control regions crossed by the alternative routes and access roads and ancillary facilities.	To provide an understanding of current air quality in Oregon and Idaho, to identify present projects that contribute to air quality degradation and climate change, and to understand how the electric generation carried by the B2H Project and other transmission lines, present and proposed, contribute to air quality and climate change issues.
Socioeconomics and Environmental Justice		
Socioeconomics	Includes the counties crossed by the B2H Project, plus cities within 50 miles of the alternative routes. Also, each Census Tract, Block, and Group crossed by B2H Project centerlines.	Corresponds with the direct and indirect socioeconomic analysis area and includes the constituent municipalities and potentially affected populations.
Environmental Justice	Counties and Census Block Groups crossed by B2H Project.	Corresponds with the direct and indirect environmental justice analysis area.
Public Health and Safety		
Noise	During construction the area is 1,000 feet from construction noise sources. During operation, the areas are the width of the right-of-way.	Areas beyond which no noise from construction or operation of Boardman to Hemingway would be detectable above EPA recommended levels.
Electrical Environment	The right-of-way width in areas occupied by people (permanently or temporarily, as in recreation sites) crossed by the alternative routes, access roads, and ancillary facilities.	Electrical effects, including magnetic field and stray voltage, do not occur beyond the right-of-way. Construction and operation of the transmission line may affect the health and safety of people.

Table 3-639. Past and Present Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Communication Facilities				
–	Communication towers throughout the Project study area	164 acres	• Points buffered by 35 feet, based on average size taken from aerial review	1, 2, 3, 4, 5, 6
Pipelines				
Cascade Natural Gas Corp. pipeline	Located in Morrow County; the pipeline is 14 miles long	174 acres	• 100-foot-wide corridor, based on average pipeline disturbance taken from aerial review	1
Northwest Corp. Gas pipeline	Located in Morrow County; the pipeline is 35 miles long	421 acres	• 100-foot-wide corridor, based on average pipeline disturbance taken from aerial review	1
Perennial Wind Chaser Station [Perennial-Windchaser, LLC]	Located in Umatilla County, Oregon; the pipeline extends south of the Perennial Wind Chaser Station 4.63 miles; the pipeline would be approximately 12 to 18 inches in diameter	59 acres	• 100-foot-wide corridor, based on average pipeline disturbance taken from aerial review	1
Transmission Lines				
Gateway West Transmission Line Project [Idaho Power and Rocky Mountain Power]	Project includes a 500-kilovolt (kV) line that is approximately 872 miles and extends between Wyoming and Idaho	2,359 acres	• Centerline for the double-circuit 500- kV sections and the single-circuit 500-kV section buffered for a 250-foot-wide corridor • Based on information in the Gateway West Draft Environmental Impact Statement	6
Northwest Corp. transmission line	Located in Morrow County, the transmission line is 35 miles long	231 acres	• 100-foot-wide corridor, based on average transmission line disturbance taken from aerial review	1

Table 3-639. Past and Present Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Perennial Wind Chaser Station [Perennial-Windchaser, LLC]	Located in Umatilla County, Oregon; the transmission line extends north to Perennial Wind Chaser Station step-up substation located adjacent to Bonneville Power Administration McNary Substation; the transmission line is 230-kV and is 1-mile long	12 acres	• 100-foot-wide corridor, based on average transmission line disturbance taken from aerial review	1
Willow Creek Wind Farm transmission line Invenergy	Located in Morrow County, the transmission line is 8 miles long	97 acres	• 100-foot-wide corridor, based on average transmission line disturbance taken from aerial review	1
Momentum Energy	Located in Morrow County, the transmission line is 6 miles long	73 acres	• 100-foot-wide corridor, based on average transmission line disturbance taken from aerial review	1
Oregon Wind Farm	Located in Umatilla County, the transmission line is 11 miles long	130 acres	• 100-foot-wide corridor, based on average transmission line disturbance taken from aerial review	1
CBE Energy	Located in Morrow County, the transmission line is 40 miles long	73 acres	• 100-foot-wide corridor, based on average transmission line disturbance taken from aerial review	1
–	Overhead transmission lines, varying from 69-kV to 500-kV. Several high-voltage transmission lines carry electricity from hydroelectric generation stations near Boardman, Oregon to interconnection points in Idaho.	16,026 acres	The following corridor widths are based on average transmission line disturbance taken from aerial review: – 500-kV: 225 feet – 345-kV: 150 feet – 230-kV: 100 feet – 138-kV: 75 feet – 69-kV or 115-kV: 50 feet	1, 2, 3, 4, 5, 6

Table 3-639. Past and Present Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Transportation Projects				
–	Interstate highways, U.S. highways, state highways, county roads, and rural roads, and railroads throughout the Project study area	77,522 acres	The following corridor widths are based on average road disturbance taken from aerial review: – Interstates: 75 feet – U.S. or State Highways: 50 feet – County Roads or Other: 25 feet – Railroads: 25 feet	1, 2, 3, 4, 5, 6
Structures				
–	Structures throughout the Project study area	77,522 acres	Structure points buffered to the following sizes based on average disturbance taken from aerial review: – Residence, Building (non-residence), school, flood control facility: 1,000 square feet – Campground: 15 acres – Cemetery: 1.4 acre – Mine: 15 acres – Other: 400 square feet – Outstructure: 100 square feet – Substation: 2 acres – Rest stop: 12 acres	1, 2, 3, 4, 5, 6
Energy Projects				
Boardman Coal Plant [Portland General Electric Company] [Oregon Department of Energy (ODOE) 2013a]	Located in Morrow County. 5,800 acre site	–	• Assessed qualitatively	1
Carty Generating Station [Portland General Electric Company]	Located in Morrow County, Oregon, adjacent to Boardman Coal Plant	112 acres	• Area in the project boundary considered as the development area	1
Coyote Springs Generating Station [Portland General Electric Company] (ODOE 2013a)	Located in Morrow County in 20 acre site within the Port Morrow Industrial Park	–	• Assessed qualitatively	1

Table 3-639. Past and Present Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Elkhorn Valley Wind Project [Idaho Power]	62 turbines located in Union County	93 acres	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	2, 3
Huntington Windfarms	The proposed site is 4.5 miles northwest of Huntington located off Malheur Lane, Durbin Creek Lane, and Interstate 84. The maximum capacity would be 20 megawatts from 12 turbines.	38 acres	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	4
Perennial Wind Chaser Station [Perennial-Windchaser, LLC] (ODOE 2015)	Located in Umatilla County, Oregon, approximately 5 miles southwest of Hermiston, Oregon, adjacent to Hermiston Generating Plant	19 acres	• Area in the project boundary considered as the development area	1
Service Buttes Wind Farm	70 turbines located in Morrow County, Oregon	105 acres	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Willow Creek Wind Farm [Invenergy]	73 turbines located in Morrow and Gilliam counties, approximately 190 miles east of Portland	110 acres	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Momentum Wind Farm	9 turbines located in Morrow County	13 acres	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1

Table 3-639. Past and Present Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Shepherd's Flat Central Wind Farm [South Hurlburt Wind LLC] (ODOE 2012a)	Located on private land in Gilliam and Morrow counties, south Interstate Highway 84 and east of Arlington, Oregon between State Highways 19 and 79. Authorized to construct and operate up to 116 wind turbines and related facility components.	624 acres (includes disturbance for all 3 Shepard's Flat wind farms combined)	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Shepherd's Flat North Wind Farm [North Hurlburt Wind LLC] (ODOE 2012b)	Located on private land in Gilliam County, south of Interstate 84 and east of Arlington; Project has 106 wind turbines and related facility components	624 acres (includes disturbance for all 3 Shepard's Flat wind farms combined)	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Shepherd's Flat South Wind Farm [Horseshoe Bend Wind, LLC] (ODOE 2012c)	Located on private land in Gilliam and Morrow counties, south Interstate Highway 84 and east of Arlington, Oregon Project has 116 wind turbines and related facility components.	624 acres (includes disturbance for all 3 Shepard's Flat wind farms combined)	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Oregon Wind Farm	Located in Umatilla County, the project area is 3,604 acres	27 acres	• Turbine points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Madison Farms and Umatilla Electric Cooperative Solar Project	Located in Umatilla County, the project area is 12 acres	12 acres	• Area in the project boundary considered as the development area	1
–	Dams located in the Oregon portion of the study area	143 acres	• Dam points buffered to 1 acre based on average disturbance taken from aerial review	1, 2, 3, 4, 5, 6

Table 3-639. Past and Present Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Mineral Resource				
Grassy Mountain Gold Project [Calico Resources USA Corp.]	Located in Malheur County, Oregon, approximately 22 miles south of Vale, Oregon and approximately 70 miles west of Boise, Idaho	103 acres	• Area in the project boundary considered as the development area	5
–	Mines, quarries and aggregate operations, including surface and underground mining operations and aggregate borrow pits in the study area	8,739 acres	• For mine polygons, area in the project boundary considered as the development area • Mine points buffered to the following sizes based on average disturbance taken from aerial review: – Element mining: 6 acres – Geothermal mining: 12 acres – Metal mining: 27 acres – Stone mining: 14 acres – Quarry: 24 acres – Sand and gravel mining: 35 acres – Stockpile: 1.5 acre	1, 2, 3, 4, 5, 6
Neal Hot Springs	Geothermal power plant located in Malheur County, near the town of Vale.	–	• Project area boundary is 5,440 acres	4
Other				
–	GAP land cover – Developed/Disturbed	144,658 acres	• Area classified as developed/disturbed considered as the development area	1, 2, 3, 4, 5, 6
Water Pipelines	Existing water pipelines within City of La Grande connecting to La Grande Reservoir (17 miles south of city boundary).	–	• No pipeline locations provided, qualitative analysis conducted.	2

Grazing

Rangeland grazing in the B2H Project area did not expand appreciably in the 1973 to 2000 USGS study period, and improving grazing practices and rangeland improvements somewhat improved range conditions during that period (Sleeter et al. 2012).

Existing Residential, Commercial, and Industrial Developments

Population growth in Oregon overall was 20.4 percent from 2000 to 2010 and overall population growth in Idaho was 28.5 percent for the same period, while growth in the B2H Project area was lower for 2000 to 2010. The growth rates for 2000 to 2010 in the six counties in the B2H Project area were; Morrow County, 1.6 percent; Union County, 5.0 percent; Umatilla County, 7.6 percent; Baker County, -3.6 percent; Malheur County, -1.0 percent and Owyhee County, 8.3 percent. Growth rates for cities in the B2H Project area were somewhat higher than for the counties with the rates for Boardman, Oregon, 12.8 percent; La Grande, Oregon, 6.1 percent; Baker City, Oregon, 0.3 percent; Ontario, Oregon, 3.5 percent and Marsing, Idaho, 15.8 percent. The overall conversion of lands for residential, commercial and industrial land uses during the 1973 to 2000 USGS study period for Segments 1, 2, 3, 4 and 5 were negligible and somewhat higher but still low for Segment 6 (Sleeter et al. 2012).

Existing Transmission Lines

High-voltage (i.e., greater than 115-kV) transmission lines carry electricity long distances and begin and end in substations that serve either generation or load centers. In some cases a formal utility corridor has been designated where these transmission lines cross public lands, but in other cases the lines are recognized as utility crossings not in a corridor.

These transmission lines range from 69-kV to 500-kV, and their rights-of-way from 100 feet to 250 feet in width (Refer to map MV-1). Several of the high-voltage transmission lines carry electricity from the electric (including hydroelectric, wind, solar, coal) generation stations near Boardman, Oregon, to interconnection points in Idaho, where they feed the western grid. These transmission lines have been in service for variable amounts of time, but generally between 20 years and 40 years.

Existing Roads and Pipelines

Existing roads within the CIAA include I-84, state highways, county roads, and numerous rural roads. The B2H Project area is primarily rural with the greatest densities of roads occurring near cities and towns. Refer to map MV-27 for general transportation facility locations within the CIAA.

Many pipeline corridors exist within the CIAA for the B2H Project. Refer to map MV-27 for general utility locations within the CIAA.

Existing Energy Projects

In the CIAA, the types of existing energy projects include power generating stations, wind farms, solar generation, and hydropower.

Generating Stations

The Coyote Springs project consists of two units powered by natural gas. Unit 1 has a 240 MW capacity and unit 2 has a 280 MW capacity. The Carty Generating Station is a natural gas power facility currently being constructed in Morrow County. This facility would have a 900 MW capacity. The Boardman Coal Plant is a coal-fired power plant in Boardman, Oregon, with 550 MW capacity The McNary Hydropower plant is located on the border of the CIAA on the Columbia River. The powerhouse associated with the McNary Dam has a 980 MW capacity. Other small dam projects within the CIAA have been considered as applicable.

Wind Farms

There are ten wind-energy projects in Gilliam, Morrow, Umatilla, and Union Counties. Additionally, two wind energy projects are under construction in Baker County. Spatial data were not available for inclusion in our analysis.

Solar

The Madison Farms and UEC Solar Project is a 4.8 MW solar energy project in in Umatilla County. Additionally, six solar projects are under construction within Malheur County. Geospatial information was requested from Malheur County, but was not available for inclusion in our analysis.

Geothermal Plants

The Neal Hot Springs is a 22 megawatt power plant that has been constructed and is undergoing commissioning in Malheur County. Spatial data were not available for inclusion in quantitative analysis; therefore, this project is analyzed qualitatively.

Existing Resource Extraction Projects

A number of mining claims; oil, gas and mineral leases; and quarries and gravel pits are located within the B2H Project area. Several active resource extraction projects exist within the CIAA, including the limestone quarry at the Ash Grove Cement plant near Weatherby, Oregon; six active gravel pits; a gold mining reclamation area; and an active gold placer mining area.

Existing Military Operations

The 47,432 acre NWSTF Boardman is located in northern Morrow County, Oregon, immediately south of Boardman and 45 miles west of Pendleton. Operations at the NWSTF Boardman include ongoing training and testing and the use of ranges by aircraft from the Naval Air Station Whidbey Island. Since 1906, all bombing and gunnery practice has used non-explosive ordnance for training purposes and high explosive ordnance has not been used. Since the early 1990s, NWSTF Boardman has been used by the Navy, Oregon National Guard, and other Services (e.g., Marine Corps, Air Force, and U.S. Air Force Reserve) for a variety of land based and aviation military readiness activities. The Navy published the ROD for the Final EIS for Military Readiness activities at the NWSTF Boardman facility in April 2016. The decision increases training activities and development of necessary ranges and range facilities.

Reasonably Foreseeable Future Actions

RFFAs are actions for which there are existing decisions, funding, formal proposals, or which are highly probable. Reasonably foreseeable future actions are not connected to the proposed B2H Project, nor are they part of the alternatives. They are projections being made so that future effects, cumulative and otherwise, can be estimated, as required by NEPA. For example, if the past, present or reasonably foreseeable future action would disturb 50 acres of a habitat in the cumulative effects analysis area, and the Proposed Action or alternative would disturb another 40 acres, the cumulative effect would be 90 acres of habitat.

Table 3-640 identifies the RFFAs located in or near the B2H Project area that may have effects on resources in the cumulative effects analysis areas.

Land Management Plan Revisions

Baker Field Office Draft Resource Management Plan and Environmental Impact Statement

The Baker Field Office Draft Resource Management Plan was released to the public on November 15, 2011. The planning area contains 428,425 acres of BLM-administered lands in portions of Baker, Union, Wallowa, Malheur, Morrow, and Umatilla Counties in Oregon and Asotin and Garfield Counties in Washington. When approved, the plan will replace the 1989 BLM Baker Resource Management Plan.

The Draft Resource Management Plan identified Alternative 1 as the preferred alternative. The BLM will continue to refine the preferred alternative through the land-use planning and NEPA process until the approved resource management plan and record of decision are signed. While the preferred alternative estimates the approved resource management plan, BLM can adjust the preferred alternative until the approved resource management plan and record of decision are signed.

The preferred alternative emphasizes adaptive management to achieve long-term ecosystem health and resiliency while providing for a variety of resource uses. The BLM would promote management activities that maintain and/or restore ecosystem health and connectivity, with a restoration emphasis on Wyoming big sagebrush and riparian habitats in areas with a degraded condition. Additional ACECs, avoidance and exclusion areas, and lands managed to protect wilderness characteristics would be added under Alternative 1. Right-of-way development, including transmission lines, would face moderate restrictions.

Table 3-640. Reasonably Foreseeable Future Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Energy Facilities				
Butter Creek Wind Project [The Ralls Corp.]	The project is located south Hermiston, Oregon and is 28,644 acres	397 acres	• Turbine points spaced evenly at 107 acre spacing based on average density of existing turbines and buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Mariah Wind Farm [Mariah Wind LLC and PacifiCorp]	The project is located in Morrow County and is 1,265 acres	21 acres	• Turbine points spaced evenly at 107 acre spacing based on average density of existing turbines • Points buffered to 1.5 acre based on average turbine disturbance taken from aerial review	1
Wheatridge Wind Farm [Wheatridge Wind Energy, LLC]	The project is located in Morrow and Umatilla counties and is 50,136 acres	5,026 acres	• Point data received for portion of project area; for the rest, turbines spaced evenly at 176 acre spacing • Points buffered to 1.5 acre based on average turbine disturbance taken from aerial review • Entire boundary of utility feature considered as part of development area	1
Transmission Line				
Wallula to McNary 230-kV [PacifiCorp]	Located in Umatilla County and will be 19 miles long	229 acres	• 100-foot-wide corridor, based on average transmission line disturbance taken from aerial review	1
Residential Subdivisions				
–	Proposed subdivisions in Ada County, ID	181 acres	• Area in the project boundary considered as the development area	6

Table 3-640. Reasonably Foreseeable Future Actions				
Action Name and Applicant	**General Location and Approximate Size of Action**	**Estimated Ground Disturbance (acres)**	**Development Assumptions for Analysis**	**Relevant Project Segment(s)**
Other				
City of La Grande	No specific site identified. Planned for southern portion of the city along 12th Street.	–	• Water storage reservoir planned with connection to existing water pipelines.	2
City of La Grande	Water Treatment Plant, no specific site identified.	–	• No information available.	2

Table Notes:

The analysis represents the best available data as required under NEPA. Spatial data were not available for inclusion in quantitative analysis for the following projects:

- U.S.730 Refinement Plan
- Coal Transfer Station
- Ella Butte Wind Power Project
- Lime Windfarms
- Longhorn Substation
- Malheur Queen Placer
- Morrow Flat Wind Project
- Rackspace Data Center
- Saddle Butte Wind Park
- Umatilla Electric Cooperative Transmission Line between Longhorn Substation and Juniper Canyon area
- Grove Solar Center
- Hyline Solar Center
- Open Range Solar Center
- Railroad Solar Center
- Thunderegg Solar Center
- Vale Air Solar Center
- Owyhee Pumped Storage Project

Southeastern Oregon Resource Management Plan Amendment and Environmental Impact Statement

The plan amendment would revise the 2002 Southeast Oregon RMP for the Malheur Field Office in the BLM Vale District as required by a 2010 settlement agreement. The scoping process was initiated in 2010. The planning area for the RMP Amendment covers 6.5 million acres, of which 4.6 million surface acres are managed by BLM. The planning area is bounded on the east by Idaho, on the south by Nevada, on the north by the Vale District's Baker Field Office, and on the west by the BLM Burns District Three Rivers and Andrews Field Offices and the Malheur National Forest. The purpose of the plan amendment is to analyze a broader range of management alternatives for OHV use, livestock grazing, and lands with wilderness characteristics.

Owyhee Field Office Resource Management Plan and Record of Decision

The planning area would be the Owyhee Field Office in Owyhee County in southeastern Idaho. The planning area encompasses approximately 1.32 million acres of public land. The new resource management plan would revise the existing 1999 RMP. The BLM Director's schedule, as of November 2013, indicates that a land-use plan evaluation was prepared in 2013 and another plan evaluation is scheduled for 2018. The RMP revision process would be scheduled based on the completed evaluations. The Owyhee Field Office is developing a travel management plan, which is expected to be completed in 2017.

Wallowa-Whitman National Forest Land and Resource Management Plan

The LRMP for the Wallowa-Whitman National Forest is currently undergoing revision, together with the other forests in the Blue Mountains – the Umatilla and Malheur. The three forest plans are collectively the Blue Mountains Forest Plans. The Wallowa-Whitman National Forest plan represents a revision of the 1990 LRMP. A Draft EIS addressing six alternatives was released to the public in March 2014; a Draft LRMP based on the agency's preferred alternative also was released. The comment period ended August 15, 2014. A Final EIS and Draft Record of Decision are currently anticipated for release during fall 2016 and final decision is expected spring 2017. Also pending final approval are the Wallowa-Whitman National Forest Travel Management Plan to govern the forest system of roads designated for motor vehicle use by the public, and the Wallowa-Whitman Invasive Species Record of Decision, which includes an Early Detection Rapid Response (EDRR) strategy for addressing new ground-disturbing activities and strategies for preventing the spread of invasive species and the treatment of known sites.

If the decision for the B2H Project is signed prior to the decision approving a revised forest plan, implementation of the B2H Project would proceed under the current (USFS 1990) LRMP and would require site-specific amendment as described in the Plan Amendments (Section 3.4). If the timing is reversed, the B2H Project decision will need to be compliant with the revised forest plan.

3.3.2.3 CUMULATIVE ASSESSMENT APPROACH

In general, quantitative analyses were performed for issues where the relevant data were available for the CIAA. If spatial data were not available for a particular cumulative action, cumulative effects were assessed qualitatively.

For purposes of this assessment, quantitative estimates of cumulative effects on resources are based on the estimated spatial extent of development for the B2H Project and each past and present action and other RFFAs. The specific methods used in these estimations are discussed in this section.

The quantitative assessment of cumulative effects was performed using a seven-step process:

1. **Compile Resource Inventory for the CIAA.** The available resource in a CIAA was compiled by overlaying a polygon representing the CIAA identified for a resource issue over the relevant resource inventory data.
2. **Estimate Spatial Extent of Existing Development.** A single base layer of existing development was defined to include the developed and disturbed (ReGAP) existing land-use inventory developed for the effects analysis; buffered transmission lines, pipelines, railroads, and roads; and data collected for past and present actions in the B2H Project area boundary.
3. **Estimate Spatial Extent of RFFA Development.** A single base layer of RFFA development was established based on the rationale or assumptions outlined in Table 3-640. The spatial extent of RFFA development was then compiled into a single base. The base layer was not developed to contain individual attribute information; rather, the base layer includes a summary of all attributes.
4. **Estimate Spatial Extent of B2H Project Development.** The area was compiled depending on the CIAA. For some resource issues, the area was created by buffering each alternative route by a specified amount (i.e., 1 mile on either side of an alternative route). For other resource issues, alternative routes were intersected with the CIAA. For example, the CIAA for water resources is the 12-digit HUC (subwatershed) drainage areas crossed by the alternative routes. Each alternative route was intersected with the 12-digit HUC (subwatershed) drainage areas to determine the spatial extent of B2H Project development for each alternative route.
5. **Estimate Total Cumulative Development.** The layers were amalgamated to generate an estimated total cumulative development for each CIAA (i.e., the existing development data layer, the RFFA development layer, and the CIAA available resource inventory layer). In areas where existing development, RFFAs, and resource inventory all occurred, only the spatial extent of existing development and the CIAA available resource inventory were calculated (i.e., excluding RFFA development) to eliminate double-counting of development of an RFFA in areas already affected by past actions.

6. **Determine Incremental B2H Project Development.** The spatial extent of the incremental B2H Project effect on an available resource in the CIAA was determined by overlaying the existing and RFFA cumulative development layers with the estimated disturbance calculations generated from the B2H Project description.
7. **Determine Remaining Available Resource.** The spatial extent of the remaining available resource (e.g., habitat) in the CIAA was determined by assessing the area outside of the estimated total cumulative development area.

3.3.3 CUMULATIVE EFFECTS

The assessment of cumulative effects is presented here for only those resources for which there is a potential for cumulative effects to occur. That is, for resources for which direct and indirect impacts from the B2H Project are anticipated.

3.3.3.1 EARTH RESOURCES

This section estimates cumulative effects on earth resources from B2H Project effects in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.1. The cumulative effects analysis for earth resources considers direct and indirect impacts from the B2H Project (described in Section 3.2.1) in conjunction with the past and present actions and RFFAs listed in Tables 3-639 and 3-640.

ISSUES IDENTIFIED FOR ANALYSIS

Geologic Hazards

Based on the analysis presented in Section 3.2.1, no direct or indirect B2H Project effects related to faults or earthquakes would occur. Therefore the B2H Project would not contribute to cumulative impacts on these, and are not analyzed. Issues identified during scoping and agency review include the hazards associated with rockslides and landslides. The B2H Project could contribute to landslide potential as discussed in Section 3.2.1. Potential cumulative effects on landslide susceptibility resulting from the loss of vegetation or ground-disturbing activities related to construction of the B2H Project. Geologic hazards could directly and indirectly affect the construction, operation, and maintenance of the B2H Project, either through direct loss of equipment or injury to personnel as a result of landslides or flooding, or indirect loss of transmission service as a result of these geologic hazards. Cumulative effects of past, present and RFFAs are not expected to affect Quaternary faults. Although future earthquakes could occur along these fault lines.

Impacts on geologic hazards could occur with the construction of B2H Project features such as roads, tower pads, and buildings. The types of potential direct and indirect effects are discussed in Section 3.2.1. Several past and present actions in the CIAA are likely to have similar effects on geologic hazards. These include:

- Roads
- Transmission lines
- Pipelines
- Wind towers

Soils

Issues identified for soil resources during scoping and agency review include increased soil erosion, unstable soils, and soil compaction. Disturbance associated with the B2H Project is anticipated to have direct cumulative effects by increasing soil erosion, compaction of soils, and conversion of agricultural lands to nonagricultural. Construction, operation, and maintenance activities also could have indirect cumulative effects by increasing soil erosion, and loss of soil productivity. The direct and indirect effects are discussed in Section 3.2.1.6.

Cumulative effects on soil resources can result from (1) alteration to the natural environment and land surface that could increase the rate of soil erosion by water or wind or (2) by compaction of those soils with higher clay content. The implementation of appropriate design features and selective mitigation measures would minimize short-term impacts, such as disturbance of surface soils and other alterations to the natural environment stemming from construction of the B2H Project, other past and present projects, and RFFAs, such that the local soil resources would be stabilized or returned to a state close to their preconstruction state. Long-term impacts on soil resources would be associated with increased public access, and the presence of structures or buildings.

Impacts on soils would occur with the construction of B2H Project features such as roads, tower pads and buildings. The types of potential direct and indirect effects are discussed in Section 3.2.1.6. Several past and present actions in the CIAA are likely to have had similar effects on soil resources. These include:

- Buildings and other structures
- Transmission lines and pipelines
- Railroads and roads
- Mines and gravel pits
- Dams
- Power plants
- Solar Development
- Structures
- Wind Power

Construction of several RFFAs in the CIAA could result in similar cumulative effects on soil resources. This includes:

- Development of wind power

Minerals

Issues identified during scoping and agency review for mineral resources include impacts on producing wells, impacts on mines and mining claims, and areas with mineral resources. Activities associated with implementation of the B2H Project could have direct and indirect cumulative effects on mineral resources. These include restriction of exploration and existing mining activities. Based on the analysis presented in Section 3.2.1, the B2H Project could contribute to cumulative impacts on mineral resources.

Impacts on mineral resources could occur with the construction of B2H Project features such as roads, tower pads and buildings. Also, the presence of the transmission line could interfere with exploration and future mining operations. The types of potential direct and indirect effects are discussed in Section 3.2.1.6. Several past and present actions in the CIAA are likely to have had similar effects on mineral resources. These include:

- Buildings and other structures
- Transmission lines and pipelines
- Railroads and roads
- Mines

Construction of several RFFAs in the CIAA could result in similar cumulative effects on mineral resources. This includes:

- Development of wind power

Paleontological Resources

Issues identified during scoping and agency review for paleontological resources include impacts on fossils and violation of Paleontological Resources Preservation Act. Disturbance associated with the B2H Project could have direct effects on paleontological resources such as the loss of a paleontological resource. Indirect effects of the B2H Project on paleontological resources could include loss of a paleontological resource through accelerated erosion and unauthorized collection or vandalism to a paleontological resource by greater access of the public to areas previously inaccessible. Indirect impacts on paleontological resources also could include increased potential for vandalism or unauthorized collection of fossils due to increased public access into previously difficult to access areas. Several past and present actions in the CIAA are likely to have similar effects on paleontological resources. These include:

- Roads
- Railroads
- Transmission lines
- Pipelines
- Residential development
- Mining

- Dams
- Power Plants
- Structures
- Wind Development

Construction of several RFFAs in the CIAA could result in similar cumulative effects on paleontological resources. This includes development of wind power.

EXISTING CONDITION

The affected environment for earth resources is discussed in Section 3.2.1.5.

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

Geologic Hazards

None of the alternative routes considered for the B2H Project in Segment 1 would be expected to contribute incrementally to cumulative impacts on geologic hazards.

Soils

Tables 3-641 through 3-645 summarizes the estimated cumulative effects on soil resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 1.

Table 3-641. Cumulative Effects Summary for High Water Erosion Susceptibility in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	59,340	1,253	116	930	2,299	57,050
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	59,621	1,227	125	983	2,335	57,286
Applicant's Proposed Action – Southern Route	58,396	1,086	116	918	2,119	56,277
West of Bombing Range Road – Southern Route	41,701	874	153	635	1,663	40,038
Longhorn	48,940	930	97	799	1,826	47,114
Interstate 84	42,311	2,129	0	499	2,628	39,682
Variation S1-A1	*22,019*	*1,403*	*0*	*166*	*1,570*	*20,449*
Variation S1-A2	*16,916*	*919*	*0*	*274*	*1,192*	*15,723*
Interstate 84 – Southern Route	43,106	1,978	0	509	2,487	40,619

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-642. Cumulative Effects Summary for Moderate Water Erosion Susceptibility in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	28,856	910	4	390	1,304	27,553
Variation S1-B1	*9,945*	*540*	*0*	*141*	*681*	*9,264*
Variation S1-B2	*9,931*	*551*	*0*	*130*	*681*	*9,250*
East of Bombing Range Road	28,868	912	4	429	1,345	27,524
Applicant's Proposed Action – Southern Route	32,719	975	4	484	1,462	31,257
West of Bombing Range Road – Southern Route	42,007	989	86	660	1,745	40,262
Longhorn	31,908	952	39	532	1,523	30,385
Interstate 84	35,694	2,230	0	536	2,766	32,928
Variation S1-A1	*3,254*	*107*	*0*	*42*	*149*	*3,104*
Variation S1-A2	*7,948*	*276*	*0*	*117*	*394*	*7,554*
Interstate 84 – Southern Route	39,575	2,295	0	628	2,923	36,652

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-643. Cumulative Effects Summary for High Wind Erosion Susceptibility in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	12,187	887	0	21	907	11,280
Variation S1-B1	*19*	*0*	*0*	*0*	*0*	*19*
Variation S1-B2	*28*	*0*	*0*	*0*	*0*	*28*
East of Bombing Range Road	12,131	897	0	172	1,069	11,061
Applicant's Proposed Action – Southern Route	12,187	887	0	21	907	11,280
West of Bombing Range Road – Southern Route	12,187	887	0	22	908	11,279
Longhorn	15,218	802	2	237	1,042	14,176

Table 3-643. Cumulative Effects Summary for High Wind Erosion Susceptibility in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Interstate 84	22,098	2,541	0	260	2,801	19,297
Variation S1-A1	*7*	*0*	*0*	*0*	*0*	*7*
Variation S1-A2	*148*	*20*	*0*	*0*	*20*	*128*
Interstate 84 – Southern Route	22,098	2,541	0	262	2,804	19,294

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-644. Cumulative Effects Summary for Moderate Wind Erosion Susceptibility in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	18,447	557	55	219	831	17,616
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	18,808	537	63	306	906	17,901
Applicant's Proposed Action – Southern Route	18,447	557	55	222	654	11,756
West of Bombing Range Road – Southern Route	12,410	505	54	95	654	11,756
Longhorn	10,391	221	71	168	460	9,931
Interstate 84	13,118	933	0	103	1,036	12,082
Variation S1-A1	*9,005*	*519*	*0*	*66*	*585*	*8,419*
Variation S1-A2	*2,388*	*66*	*0*	*35*	*101*	*2,287*
Interstate 84 – Southern Route	13,118	933	0	104	1,037	12,081

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-645. Cumulative Effects Summary for Compaction Potential (Soils with Greater than 28 Percent Clay) in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	4,898	66	0	92	158	4,740
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	4,898	66	0	92	158	4,740
Applicant's Proposed Action – Southern Route	5,918	86	0	153	239	5,679
West of Bombing Range Road – Southern Route	9,429	117	0	232	350	9,079
Longhorn	4,898	66	0	94	160	4,738
Interstate 84	4,898	66	0	94	159	4,738
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	5,918	86	0	154	240	5.678

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Soils with moderate and high susceptibility to wind and water erosion, and compaction do occur in Segment 1. Soils with susceptibility to water erosion cover greater areas than those susceptible to wind erosion, and the incremental impacts from the B2H Project, past and present projects, and other RFFAs would likely be proportional. In Segment 1, the East of Bombing Range Road Alternative would have the greatest incremental contribution to cumulative impacts on soils with high susceptibility to water erosion, and soils with moderate susceptibility to wind erosion. The West of Bombing Range Road alternative would have the greatest incremental contribution to cumulative impacts on soils with moderate susceptibility to water erosion and soils with high compaction potential. The Interstate 84 to Southern Route would have the greatest incremental contribution to cumulative impacts on soils with high susceptibility to wind erosion.

The incremental contribution to cumulative impacts of the B2H Project on soils with high and moderate susceptibility to water erosion in the CIAA varies between the alternatives approximating between 1 and 2 percent of the total resource available. For soils with moderate and high susceptibility to wind erosion, the percentage approximated between less than 1 to 2 percent of the total resource available. The amount of acreage for soils with high compaction potential is considerably less than those with susceptibility to wind and water erosion. The incremental contribution to cumulative impacts from the B2H Project on these soils varies between the alternative routes in Segment 1 from approximately 2 to

3 percent of the total amount. There are no RFFAs expected in the resource area for soils with high compaction potential.

Minerals

No active mines or mining claims, or producing wells would be affected by the B2H Project in Segment 1. There are also no areas with producing wells in the CIAA. There are several leases that are affected in Segment 1. Table 3-646 summarizes the estimated cumulative effects on mineral leases from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 1.

Table 3-646. Cumulative Effects Summary for Leases in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	1,522	35	0	0	35	1,487
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	1,592	38	0	41	79	1,513
Applicant's Proposed Action – Southern Route	1,522	35	0	0	35	1,487
West of Bombing Range Road – Southern Route	2,545	40	2	11	52	2,493
Longhorn	2,712	64	5	59	127	2,585
Interstate 84	1,482	67	0	7	74	1,408
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*239*	*3*	*0*	*0*	*3*	*235*
Interstate 84 – Southern Route	1,482	67	0	7	74	1,408

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

The alternative routes in Segment 1 would only contribute incrementally to cumulative impacts on leases. The Longhorn Alternative would have the greatest incremental contribution to cumulative impacts on leases. The incremental impacts from the B2H Project would be low, varying from approximately 0 to 3 percent of the total resource available.

Paleontological Resources

Table 3-647 through Table 3-648 summarize the estimated cumulative effects on paleontological resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 1.

Table 3-647. Cumulative Effects Summary for PFYC 3 in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	15,518	974	5	21	1,000	14,518
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	15,523	987	5	201	1,193	14,329
Applicant's Proposed Action – Southern Route	15,518	974	5	21	1,000	14,518
West of Bombing Range Road – Southern Route	15,206	968	0	22	990	14,217
Longhorn	18,093	840	14	261	1,115	16,977
Interstate 84	30,456	3,049	0	299	3,348	27,108
Variation S1-A1	*8,298*	*616*	*0*	*42*	*658*	*7,640*
Variation S1-A2	*5,410*	*324*	*0*	*98*	*422*	*4,988*
Interstate 84 – Southern Route	30,456	3,049	0	302	3,352	27,104

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-648. Cumulative Effects Summary for PFYC 4 in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	23,978	759	102	346	1,206	22,772
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	24,340	740	111	400	1,250	23,090
Applicant's Proposed Action – Southern Route	20,229	569	102	276	946	19,283
West of Bombing Range Road – Southern Route	16,830	578	67	226	871	15,960
Longhorn	16,484	450	113	281	843	15,641

Table 3-648. Cumulative Effects Summary for PFYC 4 in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Interstate 84	3,749	190	0	75	265	3,484
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	0	0	0	0	0	0
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

For alternative routes in Segment 1 that cross geologic units with a PFYC of 3, the incremental contribution of the B2H Project to cumulative impacts on paleontological resources in the CIAA would vary from less than 1 to 1.4 percent of the total resource available. For alternative routes in Segment 1 that cross geologic units with a PFYC of 4, the incremental contribution of the B2H Project to cumulative impacts on paleontological resources in the CIAA would vary from 1 to 2 percent of the total resource available.

Segment 2—Blue Mountains

Geologic Hazards

None of the alternative routes considered for the B2H Project in Segment 2 would be expected to contribute incrementally to cumulative impacts on geologic hazards.

Soils

Tables 3-649 through 3-651 summarizes the estimated cumulative effects on soil resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 2.

Table 3-649. Cumulative Effects Summary for High Water Erosion Susceptibility in Segment 2—Blue Mountains in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	3,675	97	0	43	140	3,535
Variation S2-A1	*57*	*2*	*0*	*0*	*2*	*55*
Variation S2-A2	*57*	*2*	*0*	*1*	*3*	*54*
Variation S2-B1	*501*	*11*	*0*	*2*	*13*	*488*
Variation S2-B2	*426*	*9*	*0*	*6*	*15*	*411*
Variation S2-C1	*90*	*4*	*0*	*0*	*4*	*87*
Variation S2-C2	*339*	*11*	*0*	*0*	*11*	*328*

Table 3-649. Cumulative Effects Summary for High Water Erosion Susceptibility in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Variation S2-E1	*273*	*14*	*0*	*0*	*14*	*259*
Variation S2-E2	*291*	*23*	*0*	*3*	*26*	*266*
Variation S2-F1	*3,004*	*72*	*0*	*31*	*103*	*2,901*
Variation S2-F2	*2,764*	*75*	*0*	*26*	*101*	*2,663*
Glass Hill	4,969	106	0	93	199	4,770
Variation S2-D1	*501*	*5*	*0*	*7*	*12*	*489*
Variation S2-D2	*607*	*6*	*0*	*7*	*13*	*594*
Mill Creek	3,627	116	0	50	167	3,461

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-650. Cumulative Effects Summary for Moderate Water Erosion Susceptibility in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	11,726	532	0	171	703	11,022
Variation S2-A1	*4,042*	*269*	*0*	*27*	*296*	*3,746*
Variation S2-A2	*4,145*	*267*	*0*	*53*	*321*	*3,824*
Variation S2-B1	*1,502*	*69*	*0*	*12*	*81*	*1,422*
Variation S2-B2	*1,555*	*68*	*0*	*8*	*77*	*1,479*
Variation S2-C1	*2,402*	*37*	*0*	*42*	*79*	*2,323*
Variation S2-C2	*2,620*	*57*	*0*	*19*	*76*	*2,544*
Variation S2-E1	*149*	*12*	*0*	*0*	*12*	*137*
Variation S2-E2	*278*	*40*	*0*	*2*	*42*	*236*
Variation S2-F1	*4,707*	*191*	*0*	*86*	*277*	*4,431*
Variation S2-F2	*4,482*	*153*	*0*	*55*	*207*	*4,274*
Glass Hill	10,741	487	0	142	640	10,102
Variation S2-D1	*511*	*1*	*0*	*4*	*5*	*506*
Variation S2-D2	*678*	*4*	*0*	*10*	*13*	*664*
Mill Creek	13,729	614	0	183	797	12,932

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-651. Cumulative Effects Summary for Compaction Potential (Soils with Greater than 28 Percent Clay) in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	5,909	175	0	119	295	5,615
Variation S2-A1	*39*	*0*	*0*	*0*	*0*	*39*
Variation S2-A2	*39*	*0*	*0*	*0*	*0*	*39*
Variation S2-B1	*1,065*	*21*	*0*	*11*	*32*	*1,033*
Variation S2-B2	*1,112*	*21*	*0*	*6*	*27*	*1,085*
Variation S2-C1	*1,725*	*27*	*0*	*42*	*69*	*1,656*
Variation S2-C2	*1,580*	*28*	*0*	*19*	*46*	*1,534*
Variation S2-E1	*254*	*17*	*0*	*0*	*17*	*237*
Variation S2-E2	*405*	*46*	*0*	*6*	*52*	*353*
Variation S2-F1	*3,719*	*128*	*0*	*66*	*194*	*3,525*
Variation S2-F2	*4,267*	*140*	*0*	*54*	*194*	*4,074*
Glass Hill	4,767	129	0	89	238	4,529
Variation S2-D1	*161*	*0*	*0*	*0*	*0*	*161*
Variation S2-D2	*187*	*0*	*0*	*0*	*0*	*187*
Mill Creek	7,591	346	0	92	438	7,153

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Soils with moderate and high susceptibility to water erosion and soil compaction do occur in Segment 2. The Glass Hill Alternative would have the greatest incremental impacts on soils with high susceptibility to water erosion. The Mill Creek Alternative would have the greatest incremental impacts on soils with moderate susceptibility to water erosion. The Applicant's Proposed Action Alternative would have the greatest incremental impacts on soils with high compaction potential.

The incremental contribution of the B2H Project to cumulative impacts of the B2H Project on soils with high and moderate susceptibility to water erosion, in the CIAA, vary among the alternative routes from 1 to 2 percent of the total resource available. The B2H Project would not contribute to incremental impacts on soils with moderate or high susceptibility to wind erosion for Segment 2. The incremental impacts from the B2H Project on soils with high compaction potential vary among the alternative routes in Segment 2 from 1 to 2 percent of the total amount available.

Minerals

There are no areas in Segment 2 that will have incremental impacts on mineral resources.

Paleontological Resources

Table 3-652 summarizes the estimated cumulative effects on paleontological resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 2.

Table 3-652. Cumulative Effects Summary for PFYC 3 in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Variation S2-C2	*602*	*8*	*0*	*20*	*28*	*575*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Variation S2-C2 is the only alternative in Segment 2 with incremental impacts on geologic units with a PFYC of 3, and these would approximate 3 percent of the total resource available. There would be no incremental contribution to cumulative impacts on geologic units with PFYC of 4 from the B2H Project in Segment 2.

Segment 3—Baker Valley

Geologic Hazards

For Segment 3, cumulative effects would be anticipated only on areas with moderate landslide susceptibility (Table 3-653). These areas occur only in the Timber Canyon Alternative. Cumulative effects would be expected on 2 of 434 available acres (2 percent of the total acres available); however, the B2H Project would be anticipated to contribute incrementally to cumulative effects.

Table 3-653. Cumulative Effects Summary for Moderate Landslide Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Landslide Hazard 85-100 Percentile Ranking						
Timber Canyon	434	2	0	0	2	432
Landslide Hazard 70-84 Percentile Ranking						
Timber Canyon	1,688	24	0	37	62	1,627

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Soils

Tables 3-654 through 3-658 summarizes the estimated cumulative effects on soil resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 3.

Table 3-654. Cumulative Effects Summary for High Water Erosion Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	9,827	292	0	216	509	9,318
Variation S3-A1	*1,106*	*63*	*0*	*32*	*95*	*1,011*
Variation S3-A2	*938*	*54*	*0*	*0*	*54*	*884*
Variation S3-B1	*4,804*	*138*	*0*	*85*	*223*	*4,581*
Variation S3-B2	*4,406*	*170*	*0*	*43*	*214*	*4,192*
Variation S3-B3	*4,467*	*176*	*0*	*42*	*218*	*4,249*
Variation S3-B4	*4,398*	*179*	*0*	*41*	*220*	*4,178*
Variation S3-B5	*4,279*	*176*	*0*	*43*	*220*	*4,060*
Variation S3-C1	*4,218*	*71*	*0*	*89*	*161*	*4,058*
Variation S3-C2	*4,437*	*94*	*0*	*85*	*179*	*4,258*
Variation S3-C3	*1,628*	*54*	*0*	*11*	*65*	*1,563*
Variation S3-C4	*1,435*	*46*	*0*	*9*	*54*	*1,380*
Variation S3-C5	*1,283*	*27*	*0*	*26*	*53*	*1,230*
Variation S3-C6	*3,719*	*26*	*0*	*42*	*68*	*3,651*
Flagstaff A	9,293	331	0	175	506	8,787
Timber Canyon	9,767	254	0	169	423	9,344
Flagstaff A – Burnt River Mountain	6,702	314	0	102	416	6,286
Flagstaff B	9,481	331	0	173	504	8,977
Flagstaff B – Burnt River West	6,386	278	0	82	360	6,026
Flagstaff B – Durkee	8,982	286	0	134	419	8,562

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-655. Cumulative Effects Summary for Moderate Water Erosion Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	30,249	1,327	0	406	1,733	28,515
Variation S3-A1	*6,001*	*83*	*0*	*58*	*141*	*5,860*
Variation S3-A2	*5,298*	*75*	*0*	*32*	*106*	*5,192*
Variation S3-B1	*5,118*	*117*	*0*	*61*	*179*	*4,939*
Variation S3-B2	*4,472*	*367*	*0*	*57*	*424*	*4,047*

Table 3-655. Cumulative Effects Summary for Moderate Water Erosion Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Variation S3-B3	*4,753*	*388*	*0*	*57*	*445*	*4,308*
Variation S3-B4	*4,859*	*381*	*0*	*64*	*445*	*4,415*
Variation S3-B5	*4,407*	*358*	*0*	*66*	*424*	*3,983*
Variation S3-C1	*14,698*	*898*	*0*	*205*	*1,103*	*13,866*
Variation S3-C2	*15,222*	*1,039*	*0*	*215*	*1,255*	*13,968*
Variation S3-C3	*10,595*	*811*	*0*	*138*	*949*	*9,646*
Variation S3-C4	*10,369*	*793*	*0*	*153*	*945*	*9,424*
Variation S3-C5	*7,838*	*359*	*0*	*93*	*452*	*7,386*
Variation S3-C6	*9,179*	*273*	*0*	*200*	*473*	*8,706*
Flagstaff A	29,539	1,568	0	409	1,977	27,562
Timber Canyon	39,143	932	0	644	1,576	37,566
Flagstaff A – Burnt River Mountain	25,166	1,481	0	348	1,828	23,338
Flagstaff B	29,885	1,598	0	399	1,997	27,888
Flagstaff B – Burnt River West	22,052	1,051	0	272	1,323	20,730
Flagstaff B – Durkee	24,097	973	0	398	1,370	22,726

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-656. Cumulative Effects Summary for High Wind Erosion Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	0	0	0	0	0	0
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C2	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-656. Cumulative Effects Summary for High Wind Erosion Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Variation S3-C3	*55*	*1*	*0*	*1*	*3*	*52*
Variation S3-C4	*20*	*1*	*0*	*0*	*1*	*19*
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	0	0	0	0	0	0
Timber Canyon	14	0	0	0	0	14
Flagstaff A – Burnt River Mountain	55	1	0	1	3	52
Flagstaff B	0	0	0	0	0	0
Flagstaff B – Burnt River West	0	0	0	0	0	0
Flagstaff B – Durkee	0	0	0	0	0	0

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-657. Cumulative Effects Summary for Moderate Wind Erosion Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	9,662	383	0	153	536	9,126
Variation S3-A1	*497*	*39*	*0*	*0*	*39*	*457*
Variation S3-A2	*350*	*33*	*0*	*0*	*33*	*317*
Variation S3-B1	*462*	*31*	*0*	*0*	*31*	*431*
Variation S3-B2	*2,134*	*99*	*0*	*7*	*106*	*2,028*
Variation S3-B3	*2,191*	*105*	*0*	*7*	*112*	*2,079*
Variation S3-B4	*2,343*	*110*	*0*	*8*	*117*	*2,225*
Variation S3-B5	*2,309*	*107*	*0*	*8*	*116*	*2,193*
Variation S3-C1	*9,020*	*340*	*0*	*163*	*503*	*8,517*
Variation S3-C2	*9,374*	*479*	*0*	*183*	*662*	*8,712*
Variation S3-C3	*1,456*	*173*	*0*	*9*	*182*	*1,275*
Variation S3-C4	*1,357*	*171*	*0*	*5*	*176*	*1,181*
Variation S3-C5	*410*	*85*	*0*	*4*	*89*	*321*
Variation S3-C6	*700*	*79*	*0*	*3*	*82*	*618*

Table 3-657. Cumulative Effects Summary for Moderate Wind Erosion Susceptibility in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Flagstaff A	11,500	459	0	161	619	10,881
Timber Canyon	3,251	56	0	61	117	3,134
Flagstaff A – Burnt River Mountain	3,937	292	0	17	308	3,629
Flagstaff B	11,382	456	0	159	614	10,768
Flagstaff B – Burnt River West	2,634	194	0	11	205	2,429
Flagstaff B – Durkee	3,063	194	0	11	205	2,858

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-658. Cumulative Effects Summary for Compaction Potential (Soils with Greater than 28 Percent Clay) in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	10,205	358	0	146	504	9,701
Variation S3-A1	*1,940*	*57*	*0*	*27*	*84*	*1,856*
Variation S3-A2	*2,473*	*62*	*0*	*64*	*126*	*2,347*
Variation S3-B1	*2,980*	*114*	*0*	*26*	*140*	*2,839*
Variation S3-B2	*2,705*	*231*	*0*	*63*	*294*	*2,410*
Variation S3-B3	*2,752*	*233*	*0*	*57*	*290*	*2,461*
Variation S3-B4	*2,499*	*213*	*0*	*43*	*256*	*2,243*
Variation S3-B5	*2,408*	*206*	*0*	*46*	*252*	*2,156*
Variation S3-C1	*3,927*	*146*	*0*	*58*	*203*	*3,724*
Variation S3-C2	*4,164*	*146*	*0*	*58*	*203*	*3,960*
Variation S3-C3	*7,812*	*294*	*0*	*166*	*460*	*7,352*
Variation S3-C4	*7,785*	*294*	*0*	*159*	*454*	*7,332*
Variation S3-C5	*7,789*	*128*	*0*	*149*	*277*	*7,512*
Variation S3-C6	*7,396*	*137*	*0*	*125*	*262*	*7,134*
Flagstaff A	9,622	450	0	166	616	9,006
Timber Canyon	15,541	246	0	220	466	15,076
Flagstaff A – Burnt River Mountain	13,057	598	0	266	864	12,643
Flagstaff B	9,965	477	0	178	655	9,310

Table 3-658. Cumulative Effects Summary for Compaction Potential (Soils with Greater than 28 Percent Clay) in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Flagstaff B – Burnt River West	14,360	464	0	302	765	13,595
Flagstaff B – Durkee	13,435	469	0	241	710	12,725

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Soils with moderate and high susceptibility to wind and water erosion, and soil compaction do occur in Segment 3. Soils with susceptibility to water erosion cover greater areas than those susceptible to wind erosion, and the incremental impacts from the B2H Project, past and present projects, and RFFAs would be proportional. The Applicant's Proposed Action Alternative would have the greatest incremental impacts on soils with high susceptibility to water erosion. The Timber Canyon Alternative would have the greatest incremental impacts on soils with moderate susceptibility to water erosion. The S3-C2 Variation to the Proposed Action would have the greatest incremental impacts on soils with moderate susceptibility to wind erosion. The Flagstaff B Burnt River West Alternative would have the greatest incremental impacts on soils with high compaction potential.

The incremental impacts of the B2H Project on soils with high and moderate susceptibility to water erosion, in the CIAA, varies among the alternatives approximating between less than 1 and 3 percent of the total resource available. There are no incremental impacts anticipated on soils with moderate or high susceptibility to wind erosion for Segment 3. The incremental impacts from the B2H Project on soils with high compaction potential vary among the alternatives in Segment 3 approximating 1 to 2 percent of the total amount available for those soils. There are no RFFAs expected in the resource area for soils with moderate or high susceptibility to wind or water erosion, or with high compaction potential.

Minerals

Table 3-659 summarizes the estimated cumulative effects on mineral resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 3.

Table 3-659. Cumulative Effects Summary for Active Mines and Mining Claims in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	3,322	164	0	24	187	3,135
Variation S3-A1	*5*	*5*	*0*	*0*	*5*	*0*
Variation S3-A2	*5*	*5*	*0*	*0*	*5*	*0*

Table 3-659. Cumulative Effects Summary for Active Mines and Mining Claims in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Variation S3-B1	*2,263*	*53*	*0*	*24*	*77*	*2,186*
Variation S3-B2	*1,473*	*92*	*0*	*6*	*98*	*1,375*
Variation S3-B3	*1,473*	*92*	*0*	*6*	*98*	*1,375*
Variation S3-B4	*1,026*	*63*	*0*	*0*	*63*	*963*
Variation S3-B5	*964*	*58*	*0*	*0*	*58*	*905*
Variation S3-C1	*1,047*	*99*	*0*	*0*	*99*	*949*
Variation S3-C2	*1,202*	*142*	*0*	*23*	*165*	*1,037*
Variation S3-C3	*2,844*	*237*	*0*	*61*	*297*	*2,547*
Variation S3-C4	*3,112*	*239*	*0*	*60*	*299*	*2,813*
Variation S3-C5	*1,958*	*40*	*0*	*43*	*82*	*1,875*
Variation S3-C6	*4,213*	*21*	*0*	*116*	*137*	*4,076*
Flagstaff A	2,023	169	0	0	169	1,854
Timber Canyon	2,079	98	0	43	140	1,939
Flagstaff A – Burnt River Mountain	3,820	307	0	56	363	3,457
Flagstaff B	2,532	203	0	6	209	2,324
Flagstaff B – Burnt River West	3,443	144	0	42	187	3,256
Flagstaff B - Durkee	5,698	126	0	106	232	5,466

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

The alternative routes considered in Segment 3 would contribute incrementally to cumulative impacts on areas with active mines or mining claims. The S3-C6 Variation to the Proposed Action would have the greatest incremental contribution to cumulative impacts on areas with active mines or mining claims. The amount of cumulative development would vary from 1 percent to 3 percent of the total resource available.

Paleontological Resources

Table 3-660 and Table 3-661 summarize the estimated cumulative effects on paleontological resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 3.

Table 3-660. Cumulative Effects Summary for PFYC 3 in Segment 3—Baker Valley in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	5,813	468	0	23	491	5,322
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C1	*5,813*	*468*	*0*	*25*	*492*	*5,321*
Variation S3-C2	*5,813*	*468*	*0*	*24*	*492*	*5,321*
Variation S3-C3	*6,352*	*455*	*0*	*41*	*496*	*5,856*
Variation S3-C4	*6,352*	*455*	*0*	*42*	*496*	*5,856*
Variation S3-C5	*7,156*	*121*	*0*	*162*	*282*	*6,873*
Variation S3-C6	*6,110*	*81*	*0*	*162*	*243*	*5,867*
Flagstaff A	5,813	468	0	23	490	5,322
Timber Canyon	6,947	480	0	25	505	6,443
Flagstaff A – Burnt River Mountain	6,352	455	0	38	493	5,859
Flagstaff B	5,813	468	0	23	490	5,322
Flagstaff B – Burnt River West	7,156	121	0	138	259	6,897
Flagstaff B – Durkee	6,110	81	0	139	220	5,889

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-661. Cumulative Effects Summary for PFYC 4 in Segment 3—Baker Valley in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	18,895	766	0	338	1,104	17,791
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*132*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*3,719*	*206*	*0*	*43*	*249*	*3,470*
Variation S3-B2	*5,278*	*418*	*0*	*85*	*503*	*4,775*
Variation S3-B3	*5,648*	*423*	*0*	*92*	*515*	*5,133*
Variation S3-B4	*5,759*	*424*	*0*	*113*	*537*	*5,222*

Table 3-661. Cumulative Effects Summary for PFYC 4 in Segment 3—Baker Valley in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Variation S3-B5	*5,255*	*418*	*0*	*86*	*504*	*4,751*
Variation S3-C1	*11,513*	*290*	*0*	*230*	*520*	*10,993*
Variation S3-C2	*11,173*	*316*	*0*	*221*	*537*	*10,636*
Variation S3-C3	*4,848*	*137*	*0*	*100*	*237*	*4,611*
Variation S3-C4	*4,547*	*116*	*0*	*71*	*187*	*4,359*
Variation S3-C5	*2,635*	*77*	*0*	*67*	*144*	*2,491*
Variation S3-C6	*5,876*	*93*	*0*	*96*	*189*	*5,687*
Flagstaff A	20,440	978	0	381	1,359	19,080
Timber Canyon	11,266	256	0	207	462	10,803
Flagstaff A – Burnt River Mountain	13,775	826	0	260	1,086	12,688
Flagstaff B	20,832	984	0	387	1,370	19,462
Flagstaff B – Burnt River West	12,085	771	0	240	1,011	11,074
Flagstaff B – Durkee	15,195	787	0	269	1,056	14,139
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

The incremental impacts of the B2H Project on paleontological resources in the CIAA vary among the alternatives approximating between 0 and 2 percent of the total resource available for geologic units with a PFYC of 3. For geologic units with a PFYC of 4, the percentage approximated between approximately 2 percent of the total resource available for all alternatives.

Segment 4—Brogan

Geologic Hazards

There are no incremental impacts on geologic hazards in the CIAA for the alternatives and their variations in Segment 4

Soils

Tables 3-662 through 3-665 summarizes the estimated cumulative effects on soil resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 4.

Table 3-662. Cumulative Effects Summary for High Water Erosion Susceptibility in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	5,899	40	0	63	103	5,796
Variation S4-A1	*641*	*14*	*0*	*11*	*25*	*616*
Variation S4-A2	*748*	*20*	*0*	*15*	*35*	*713*
Variation S4-A3	*611*	*11*	*0*	*17*	*28*	*583*
Tub Mountain South	32,538	739	0	545	1,284	31,254
Willow Creek	24,295	291	0	416	707	23,587

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-663. Cumulative Effects Summary for Moderate Water Erosion Susceptibility in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	33,278	373	0	646	1,019	32,259
Variation S4-A1	*2,558*	*177*	*0*	*42*	*219*	*2,338*
Variation S4-A2	*2,424*	*211*	*0*	*48*	*259*	*2,164*
Variation S4-A3	*2,632*	*211*	*0*	*49*	*259*	*2,373*
Tub Mountain South	13,095	627	0	219	846	12,249
Willow Creek	12,387	275	0	199	473	11,914

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-664. Cumulative Effects Summary for Moderate Wind Erosion Susceptibility in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	5,557	48	0	63	112	5,445
Variation S4-A1	*708*	*20*	*0*	*11*	*31*	*677*
Variation S4-A2	*816*	*26*	*0*	*15*	*42*	*774*
Variation S4-A3	*679*	*18*	*0*	*17*	*34*	*644*
Tub Mountain South	23,901	442	0	394	836	23,065
Willow Creek	16,102	131	0	261	393	15,709

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-665. Cumulative Effects Summary for Compaction Potential (Soils with Greater than 28 Percent Clay) in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	39,911	324	0	749	1,073	38,838
Variation S4-A1	*1,822*	*103*	*0*	*24*	*128*	*1,694*
Variation S4-A2	*1,792*	*111*	*0*	*19*	*130*	*1,662*
Variation S4-A3	*1,757*	*109*	*0*	*18*	*127*	*1,631*
Tub Mountain South	35,773	682	0	627	1,309	34,464
Willow Creek	34,192	372	0	596	967	33,225

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Soils with moderate and high susceptibility water erosion, moderate susceptibility to wind erosion, and soils with compaction potential do occur in Segment 4. Soils with susceptibility to water erosion cover greater areas than those susceptible to wind erosion, and the incremental impacts from the B2H Project, past and present projects, and RFFAs would be proportional. The Tub Mountain South Alternative would have the greatest incremental impacts on soils with high susceptibility to water erosion and moderate susceptibility to wind erosion. The Applicant's Proposed Action Alternative would have the greatest incremental impact on soils with moderate susceptibility to water erosion, and those soils with a high compaction potential.

The incremental impacts of the B2H Project on soils with high and moderate susceptibility to water erosion, in the CIAA, varies among the alternatives approximating between less than 1 and 3 percent of

the total resource available. The incremental impacts on areas with moderate susceptibility to wind erosion vary between 1 and 3 percent of the total resource available. The incremental impacts from the B2H Project on soils with high compaction potential vary among the alternatives in Segment 4 approximating 1 to 2 percent of the total amount available for those soils. There are no RFFAs expected for Segment 4 in the resource area for soils with moderate or high susceptibility to wind or water erosion, or with high compaction potential.

Minerals

Tables 3-666 through 3-668 summarize the estimated cumulative effects on mineral resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 4.

Table 3-666. Cumulative Effects Summary for Active Mines and Mining Claims in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	3,342	14	0	87	101	3,240
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*5*	*5*	*0*	*0*	*5*	*0*
Variation S4-A3	*4*	*4*	*0*	*0*	*4*	*0*
Tub Mountain South	5,021	109	0	82	192	4,829
Willow Creek	2,816	14	0	61	75	2,741

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-667. Cumulative Effects Summary for Leases in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	7,319	41	0	142	183	7,136
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	25,433	220	0	503	724	24,709
Willow Creek	6,722	30	0	102	133	6,589

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-668. Cumulative Effects Summary for Producing Oil and Gas and Geothermal Wells in Segment 4—Brogan in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	1,517	8	0	26	33	1,483
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	2,885	13	0	82	95	2,790
Willow Creek	1,517	8	0	24	32	1,485
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

For Segment 4, there would be incremental impacts on leases, active mines and mining claims, and producing wells from the B2H Project. The Applicant's Proposed Action Alternative would have the greatest incremental impacts on areas with active mines. The Tub Mountain South would have the greatest incremental impacts on areas with leases and producing wells.

For areas with active mines and mining claims the incremental impacts in the CIAA for Segment 4 would vary between 2 and 3 percent of the total resource available for the alternatives. For leases, the incremental impacts would average about 2 percent of the total resource available for all alternatives. For areas with producing wells the incremental impacts vary between 2 and 3 percent for the alternatives.

Paleontological Resources

Table 3-669 and Table 3-670 summarize the estimated cumulative effects on paleontological resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 4.

Table 3-669. Cumulative Effects Summary for PFYC 3 in Segment 4—Brogan in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	8,406	245	0	135	379	8,026
Variation S4-A1	*4,880*	*193*	*0*	*70*	*263*	*4,617*
Variation S4-A2	*4,929*	*232*	*0*	*76*	*308*	*4,621*
Variation S4-A3	*5,056*	*230*	*0*	*82*	*312*	*4,744*

Table 3-669. Cumulative Effects Summary for PFYC 3 in Segment 4—Brogan in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Tub Mountain South	4,939	232	0	68	301	4,639
Willow Creek	4,894	193	0	60	253	4,641
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Table 3-670. Cumulative Effects Summary for PFYC 4 in Segment 4—Brogan in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	18,336	110	0	257	368	17,968
Variation S4-A1	*838*	*11*	*0*	*12*	*23*	*815*
Variation S4-A2	*878*	*16*	*0*	*15*	*30*	*847*
Variation S4-A3	*837*	*15*	*0*	*15*	*30*	*807*
Tub Mountain South	34,386	618	0	605	1,223	33,164
Willow Creek	29,883	309	0	484	793	29,090
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

For alternative routes in Segment 4 that cross geologic units with a PFYC of 3, the incremental contribution of the B2H Project to cumulative impacts on paleontological resources in the CIAA would be about 2 percent. For alternative routes in Segment 4 that cross geologic units with a PFYC of 4, the incremental contribution of the B2H Project to cumulative impacts on paleontological resources in the CIAA would vary from 1 and 2 percent of the total resource available.

Segment 5—Malheur

Geologic Hazards

None of the alternative routes considered for the B2H Project in Segment 5 would be expected to contribute incrementally to cumulative impacts on geologic hazards.

Soils

Table 3-671 through Table 3-674 summarize the estimated cumulative effects on soil resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 5.

Table 3-671. Cumulative Effects Summary for High Water Erosion Susceptibility in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	12,498	302	0	182	484	12,014
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*1,399*	*75*	*0*	*20*	*94*	*1,304*
Variation S5-B2	*1,861*	*114*	*0*	*33*	*147*	*1,714*
Malheur S	13,174	293	0	228	521	12,650
Malheur A	14,424	364	0	220	585	13,840

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-672. Cumulative Effects Summary for Moderate Water Erosion Susceptibility in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	40,959	324	0	681	1,005	39,954
Variation S5-A1	*11,458*	*54*	*0*	*140*	*194*	*11,264*
Variation S5-A2	*11,460*	*38*	*0*	*146*	*184*	*11,275*
Variation S5-B1	*3,762*	*78*	*0*	*33*	*111*	*3,651*
Variation S5-B2	*3,523*	*78*	*0*	*20*	*99*	*3,424*
Malheur S	44,248	433	0	736	1,169	43,079
Malheur A	42,294	526	0	700	1,225	41,068

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-673. Cumulative Effects Summary for Moderate Wind Erosion Susceptibility in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	13,195	278	0	187	464	12,730
Variation S5-A1	*2,223*	*21*	*0*	*27*	*48*	*2,175*
Variation S5-A2	*2,176*	*14*	*0*	*36*	*50*	*2,126*
Variation S5-B1	*964*	*49*	*0*	*20*	*69*	*895*
Variation S5-B2	*1,074*	*56*	*0*	*12*	*68*	*1,006*
Malheur S	10,017	251	0	149	400	9,617
Malheur A	11,271	322	0	144	467	10,804

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-674. Cumulative Effects Summary for Compaction Potential (Soils with Greater than 28 Percent Clay) in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	43,321	336	0	721	1,056	42,265
Variation S5-A1	*9,235*	*33*	*0*	*113*	*146*	*9,089*
Variation S5-A2	*9,284*	*25*	*0*	*110*	*134*	*9,149*
Variation S5-B1	*3,641*	*68*	*0*	*33*	*101*	*3,540*
Variation S5-B2	*3,350*	*66*	*0*	*19*	*85*	*3,265*
Malheur S	52,803	576	0	892	1,468	51,335
Malheur A	52,273	745	0	858	1,603	50,670

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Soils with moderate and high susceptibility to water erosion, moderate susceptibility to wind erosion, and soils compaction potential do occur in Segment 5. Soils with susceptibility to water erosion cover greater areas than those susceptible to wind erosion, and the incremental impacts from the B2H Project, past and present projects, and RFFAs would be proportional. The Malheur S Alternative would have the greatest incremental impacts on soils with high and moderate susceptibility to water erosion, and those soils with high compaction potential. The Applicant's Proposed Action Alternative would have the greatest incremental impacts on soils with moderate susceptibility to wind erosion.

The incremental contribution of the B2H Project to cumulative impacts on soils with high and moderate susceptibility to water erosion, soils with moderate susceptibility to wind erosion, and soils with high compaction potential in the CIAA would vary among the alternative routes from 1 to 2 percent of the total resource available.

Minerals

Tables 3-675 through 3-677 summarize the estimated cumulative effects on mineral resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 5.

Table 3-675. Cumulative Effects Summary for Active Mines and Mining Claims in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	993	38	0	3	41	952
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*5*	*5*	*0*	*0*	*5*	*0*
Variation S5-B2	*3*	*3*	*0*	*0*	*3*	*0*
Malheur S	5,716	93	0	88	181	5,535
Malheur A	6,601	90	0	128	219	6,382

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-676. Cumulative Effects Summary for Producing Oil and Gas and Geothermal Wells in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	1,745	8	0	42	49	1,696
Variation S5-A1	*15*	*1*	*0*	*0*	*1*	*14*
Variation S5-A2	*14*	*0*	*0*	*0*	*0*	*13*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*
Malheur S	1,730	7	0	43	50	1,680
Malheur A	1,730	7	0	41	48	1,682

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-677. Cumulative Effects Summary for Leases in Segment 5—Malheur in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	*19,988*	*151*	*0*	*351*	*502*	*19,487*
Variation S5-A1	*8,627*	*38*	*0*	*83*	*121*	*8,506*
Variation S5-A2	*9,636*	*32*	*0*	*129*	*161*	*9,475*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*
Malheur S	*14,143*	*108*	*0*	*265*	*372*	*13,771*
Malheur A	*14,143*	*108*	*0*	*256*	*363*	*13780*
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

For Segment 5, the B2H Project would contribute incrementally to cumulative impacts on leases, active mines and mining claims, producing wells, and leases. For areas with active mines and mining claims and leases, the incremental contribution of the B2H Project to cumulative impacts in the CIAA would vary among the alternative routes from less than 1 to 2 percent of the total resource available. For areas with producing wells, the incremental contribution of the B2H Project to cumulative impacts would be 2 percent for all alternative routes.

Paleontological Resources

Table 3-678 summarizes the estimated cumulative effects on paleontological resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 2.

Table 3-678. Cumulative Effects Summary for PFYC 4 in Segment 5—Malheur in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	12,498	302	0	182	484	12,014
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*1,399*	*75*	*0*	*20*	*94*	*1,304*
Variation S5-B2	*1,861*	*114*	*0*	*33*	*147*	*1,714*
Malheur S	13,174	293	0	228	521	12,650
Malheur A	14,424	364	0	220	585	13,840
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

There would be no incremental contribution to cumulative impacts on geologic units with PFYC of 3 from the B2H Project. For alternative routes that cross geologic units with a PFYC of 4, the incremental

contribution of the B2H Project to cumulative impacts would vary from 1 to 2 percent of the total resource available.

Segment 6—Treasure Valley

Geologic Hazards

None of the alternative routes considered for the B2H Project in Segment 6 would be expected to contribute incrementally to cumulative impacts on geologic hazards.

Soils

Tables 3-679 through 3-683 summarize the estimated cumulative effects on soil resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 6.

Table 3-679. Cumulative Effects Summary for High Water Susceptibility in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	3,142	191	0	25	216	2,926
Variation S6-A1	*1,041*	*67*	*0*	*0*	*67*	*974*
Variation S6-A2	*1,261*	*68*	*0*	*13*	*81*	*1,180*
Variation S6-B1	*1,019*	*47*	*0*	*21*	*69*	*951*
Variation S6-B2	*983*	*41*	*0*	*8*	*48*	*935*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-680. Cumulative Effects Summary for Moderate Water Susceptibility in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	16,666	1,076	0	244	1,320	15,346
Variation S6-A1	*6,278*	*378*	*0*	*70*	*448*	*5,830*
Variation S6-A2	*6,575*	*394*	*0*	*57*	*452*	*6,123*
Variation S6-B1	*7,891*	*568*	*0*	*87*	*656*	*7,236*
Variation S6-B2	*5,671*	*440*	*0*	*76*	*516*	*5,155*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-681. Cumulative Effects Summary for High Wind Susceptibility in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	1,659	118	0	19	137	1,522
Variation S6-A1	*309*	*25*	*0*	*1*	*26*	*282*
Variation S6-A2	*351*	*26*	*0*	*4*	*30*	*322*
Variation S6-B1	*819*	*42*	*0*	*9*	*52*	*768*
Variation S6-B2	*512*	*29*	*0*	*5*	*34*	*478*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-682. Cumulative Effects Summary for Moderate Wind Susceptibility in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	5,323	363	0	28	390	4,933
Variation S6-A1	*1,957*	*155*	*0*	*0*	*155*	*1,802*
Variation S6-A2	*2,361*	*175*	*0*	*15*	*190*	*2,171*
Variation S6-B1	*2,565*	*188*	*0*	*24*	*212*	*2,352*
Variation S6-B2	*2,063*	*153*	*0*	*8*	*161*	*1,901*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-683. Cumulative Effects Summary for Compaction Potential (Soils with Greater than 28 Percent Clay) in Segment 6—Treasure Valley in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	6,118	254	0	92	346	5772
Variation S6-A1	*3,851*	*123*	*0*	*58*	*180*	*3,671*
Variation S6-A2	*3,686*	*118*	*0*	*34*	*152*	*3,533*
Variation S6-B1	*232*	*10*	*0*	*0*	*10*	*222*
Variation S6-B2	*16*	*1*	*0*	*0*	*1*	*15*
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Soils with moderate and high susceptibility to water and wind erosion, and soils with compaction potential do occur in Segment 6. Soils with susceptibility to water erosion cover greater areas than those susceptible to wind erosion, and the incremental impacts from the B2H Project, past and present projects, and RFFAs would be proportional. The incremental contribution of the B2H Project to cumulative impacts on soils with high and moderate susceptibility to water erosion, moderate and high susceptibility to wind erosion, and soils with high compaction potential would vary among the alternative routes from less than 1 and 2 percent of the total resource available.

Minerals

Table 3-684 summarizes the estimated cumulative effects on mineral resources from the B2H Project and past and present actions, and other RFFAs identified in the CIAA for Segment 6.

Table 3-684. Cumulative Effects Summary for Active Mines and Mining Claims in Segment 6—Treasure Valley in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	3,836	158	0	94	252	3,584
Variation S6-A1	*2,673*	*98*	*0*	*51*	*150*	*2,523*
Variation S6-A2	*2,002*	*68*	*0*	*41*	*109*	*1,893*
Variation S6-B1	*1,026*	*59*	*0*	*43*	*102*	*924*
Variation S6-B2	*1,026*	*59*	*0*	*38*	*97*	*929*
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

For Segment 6, there would be incremental impacts on active mines and mining claim from the B2H Project. The Applicant's Proposed Action Alternative would have the greatest incremental contribution

to cumulative impacts in areas with active mines and mining claims. For areas with active mines and mining claims the incremental contribution to cumulative impacts in the CIAA for Segment 6 would vary among the alternative routes from 2 to 4 percent of the total resource available.

Paleontological Resources

Table 3-685 and Table 3-686 summarize the estimated cumulative effects on paleontological resources from the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 6.

Table 3-685. Cumulative Effects Summary for PFYC 3 in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	18,657	1,241	0	306	1,547	17,110
Variation S6-A1	*5,275*	*382*	*0*	*79*	*461*	*4,814*
Variation S6-A2	*5,547*	*413*	*0*	*97*	*511*	*5,036*
Variation S6-B1	*14,208*	*903*	*0*	*199*	*1,103*	*13,105*
Variation S6-B2	*12,307*	*733*	*0*	*173*	*906*	*11,401*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Table 3-686. Cumulative Effects Summary for PFYC 4 in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	3,555	125	0	61	187	3,368
Variation S6-A1	*2,923*	*101*	*0*	*46*	*147*	*2,776*
Variation S6-A2	*2,729*	*91*	*0*	*43*	*134*	*2,594*
Variation S6-B1	*0*	*0*	*0*	*0*	*0*	*0*
Variation S6-B2	*0*	*0*	*0*	*0*	*0*	*0*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

For alternative routes that cross geologic units with a PFYC of 3, the incremental impacts of the B2H Project on paleontological resources in the CIAA would vary among the alternative routes from 1 to 2 percent of the total resource available. For alternative routes that cross geologic units with a PFYC of 4,

the incremental impacts of the B2H Project on paleontological resources in the CIAA would be approximately 2 percent.

3.3.3.2 Water Resources

This section estimates cumulative effects on water resources from B2H Project effects in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.2.5.

The cumulative effects analysis for water resources considers direct and indirect impacts from the B2H Project (described in Section 3.2.2) in conjunction with the past and present actions and RFFAs listed in Tables 3-639 and 3-640.

Issues Identified for Analysis

Public scoping and ongoing agency review have identified several issues relating to water resources requiring additional analysis, including alteration of existing water quality by sedimentation or temperature variation, loss of streamside vegetation, disturbance or loss of wetlands and decreased availability of traditional foods and associated supportive water resources.

Cumulative effects on streams, impaired waters and wetlands, as well as traditional foods and associated water resources, are anticipated with the implementation of the B2H Project as a result of anticipated direct and indirect effects, such as streamside vegetation removal, ground disturbance especially in areas of highly erodible soils, areas of streambank alteration to accommodate stream crossings, dust deposition, and permanent removal or loss of wetlands. These effects are described in greater detail in Section 3.2.2.6 under Types of Potential Effects.

Cumulative effects on streams and wetlands are analyzed and discussed quantitatively, while cumulative effects on traditional foods are analyzed and discussed qualitatively. Cumulative effects on RCAs are discussed in Section 3.3.3.3.

Existing Condition

Agriculture, residential, commercial, and industrial development have modified existing water resources throughout the B2H Project area through the development of water wells, piping streams and rivers for redirection and distribution, production and disposal of effluent, and capture/storage and discharge of surface water from manmade reservoirs or other storage facilities such as water towers.

Industrial development primarily associated with linear facilities, including electric transmission lines, natural gas pipelines, roads and railroads constitute the greatest extent of impact on water resources. Areas of aggregate mining (including sand and gravel mines), residential and commercial developments in areas of population centers centered along Interstate 84 have also contributed to ground disturbance and increased sedimentation from development. Agricultural use of floodplain and wetland areas for active croplands and grazing areas occurs in areas around La Grande southeast to the Idaho border. Minor development associated with dispersed rural residences and agricultural development is located throughout the B2H Project area.

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

Streams

Permanent impacts on perennial and intermittent streams could occur with the construction of such B2H Project features as hardened stream crossings (culverts, larger bridge structures that require piers or footings) or other B2H Project-associated structures that may be located below the ordinary high water mark. Implementation of stream crossings may reduce flood capacity and create backwater conditions upstream of the structures during high precipitation events. Structures also may create turbid conditions around the area of impact and create erosional features, increasing turbidity during flood events

Temporary impacts on perennial and intermittent streams could occur with the construction activities associated with installation of stream crossings, access roads or maintenance of the 250-foot wide right-of-way near streams. Temporary crushing or removal of streamside vegetation would result in temporary increases to stream temperature by reducing shade producing capability. Soil disturbance within 50 feet of streams could result in temporary impacts on sediment loads within either intermittent or perennial streams. The types of potential direct and indirect effects are described in greater detail in the Section 3.2.2.6.

Several past and present actions in the CIAA are likely to have similarly affected streams through removal of streamside vegetation, construction of impervious surfaces that may lead untreated stormwater directly to streams, and disturbance to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on streams, though it is assumed these RFFAs would take similar steps to avoid, minimize, and mitigate potential impacts on water quality of streams. Table 3-687 summarizes the past and present actions and other RFFAs identified in the CIAA for Segment 1.

Table 3-687. Existing Cumulative Development for Streams in Segment 1—Morrow-Umatilla

Stream Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Perennial	• Active Mines – sand and stone • Residential Structures • Communication Towers • Pipelines • Roads • Oregon Dams • Northwest Corps, Umatilla Electric Coop Electric Transmission Lines	• Wheatridge Wind Farm Utility • Wallula to McNary 230-kV PacifiCorp Transmission Line
Intermittent	• Aggregate/Mineral Mining • Residential and Communications Structures • Cascade Natural Gas, Perennial Wind Chaser, Northwest Corp and Other Pipelines • CBE, Northwest Corp, and other Transmission Lines • Oregon Wind and Service Buttes Wind Energy Development • Railroads • Roads	• Buttercreek Wind Turbines • Wheatridge Wind Farm Utility • Wheatridge Wind Turbines • Mariah Wind Turbines • Wallula to McNary 230-kV PacifiCorp Transmission Line

The past and present actions and other RFFAs identified above include those used to quantitatively assess incremental water quality impacts in the CIAA for Segment 1.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 1 would contribute to and increase the cumulative impacts on intermittent and perennial streams. Table 3-688 summarizes the extent of the perennial and intermittent streams, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance. No impaired streams are crossed by the alternative routes within Segment 1 and are not assessed in this section.

Table 3-688. Cumulative Effects Summary for Streams in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Perennial Streams							
Applicant's Proposed Action	28,711	788	0	319	1,107	27,604	28.8
Variation S1-B1	*6,334*	*167*	*0*	*6*	*173*	*6,161*	*3.4*
Variation S1-B2	*6,334*	*167*	*0*	*15*	*182*	*6,152*	*8.2*
East of Bombing Range Road	28,711	788	0	90	879	27,832	10.3
Applicant's Proposed Action – Southern Route	33,269	707	0	333	1,040	32,228	32.0
West of Bombing Range Road – Southern Route	41,303	1,005	235	349	1,589	39,715	22.0
Longhorn	32,983	839	0	85	924	32,059	9.2
Interstate 84	46,485	1,256	1	383	1,641	44,844	23.4
Variation S1-A1	*6,712*	*160*	*0*	*154*	*314*	*6,398*	*49.0*
Variation S1-A2	*5,435*	*160*	*0*	*6*	*166*	*5,269*	*3.9*
Interstate 84 – Southern Route	51,043	1,175	1	398	1,574	49,469	25.3
Intermittent Streams							
Applicant's Proposed Action	107,322	2,243	63	652	2,959	104,363	22.1
Variation S1-B1	*10,441*	*273*	*0*	*43*	*316*	*10,125*	*13.6*
Variation S1-B2	*10,441*	*273*	*0*	*45*	*318*	*10,123*	*14.2*
East of Bombing Range Road	107,322	2,243	63	422	2,728	104,594	15.5
Applicant's Proposed Action – Southern Route	125,049	2,592	63	691	3,347	121,702	20.7
West of Bombing Range Road – Southern Route	136,975	2,854	853	644	4,351	132,624	14.8
Longhorn	104,097	2,082	54	382	2,518	101,579	15.2

Table 3-688. Cumulative Effects Summary for Streams in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	112,911	2,717	24	567	3,308	109,603	17.1
Variation S1-A1	*34,692*	*1,047*	*0*	*182*	*1,228*	*33,463*	*14.8*
Variation S1-A2	*26,520*	*779*	*0*	*88*	*868*	*25,653*	*10.2*
Interstate 84 – Southern Route	130,638	3,066	24	614	3,704	126,934	16.6

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation would result in the greatest incremental disturbance to perennial streams for all alternative routes and is expected to contribute up to 30 percent of the estimated cumulative development. Incremental disturbance to intermittent streams is anticipated to result from B2H Project implementation, but would contribute up to 22 percent of the estimated cumulative development. Only a minimal amount of cumulative disturbance (approximately 1 percent) to all intermittent streams mapped in the CIAA would be anticipated.

Of the alternatives considered in Segment 1, the West of Bombing Range Road-Southern Route Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on perennial streams, and the East of Bombing Range Road Alternative would contribute approximately half as much estimated cumulative development as the Applicant's Proposed Action Alternative on perennial streams. The West of Bombing Range Road – Southern Route would contribute approximately 25 percent less cumulative development on intermittent streams than the Applicant's Proposed Action Alternative in Segment 1 (Table 3-688).

Of the alternatives considered in Segment 1, the West of Bombing Range Road -Southern Route Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on intermittent streams, and the East of Bombing Range Road Alternative would contribute less estimated cumulative development as the Applicant's Proposed Action Alternative on intermittent streams. The East of Bombing Range Road – Southern Route would contribute approximately 3 percent less cumulative development on intermittent streams than the Applicant's Proposed Action Alternative in Segment 1 (Table 3-688).

Past actions in the CIAA—such as agricultural fields, residential development, mining operations, wind-energy development, pipelines, and roads—have resulted in the degradation of water quality and water quantity. Use of ground and surface waters for irrigated agriculture and grazing and watering of livestock likely have contributed to the overall reduction in water availability. The same activities, coupled with active mining operations, construction of wind-energy facilities, pipelines and maintenance

of roads likely have contributed to degradation of waters through the introduction of untreated overland stormwater runoff or direct discharge releases. Present actions also are likely to result in negative effects on water quality, though it is assumed that selective mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features and out-of-bank stream spanning, avoidance, or minimization of disturbance to water resources is anticipated to limit cumulative effects on both perennial and intermittent streams.

Wetlands

Both temporary and permanent impacts on wetlands would occur with the construction of features such as stream crossings, access roads, tower pads, and buildings or maintenance actions within the 250-foot wide right-of-way. Temporary crushing or removal of vegetation within wetlands would result in both temporary and permanent disturbance to and loss of wetlands. Removal of individual trees, or clearing and grubbing of vegetation within wetlands would result in loss of wetland area and function. Construction of impervious surfaces requiring fill within wetlands would negatively affect flood storage and water quality functions of the wetland. The types of potential direct and indirect effects are described in greater detail in Section 3.2.2.6.

As with the B2H Project, commercial and industrial projects are required to follow federal and state regulations requiring design features and selective mitigation measures to maintain compliance with regulations (referenced in Chapter 3) to minimize or reduce impacts on water resources. Unavoidable impacts on wetlands would require permitting through both state and federal agencies. Inclusive of the permitting process would be a requirement for implementation of compensatory wetland mitigation, plans, including best management practices to reduce soil erosion and provide sediment control in areas of proposed ground disturbance and measures to reduce or avoid impacts on water resources from soil disturbance activities.

Several past and present actions in the CIAA are likely to have similarly affected wetlands through direct loss of wetland types, temporary impacts on wetlands through removal or crushing of vegetation and disturbance to soils. Impacts on wetlands vary by wetland type due to rates of recovery; forested wetlands would take longer to recover than emergent wetland types. Construction of several RFFAs in the CIAA, including the Wallula to McNary 230-kV Transmission Line, would result in similar cumulative effects on wetlands, though it is assumed these projects would take similar steps to avoid, minimize, and mitigate potential impacts on wetlands. Wetland mitigation required under federal and state permits, also may offset the total cumulative effects on wetland communities. The degree of effectiveness of mitigation is variable and dependent on site conditions. Mitigation is discussed in detail in Section 3.2.2.4 – Impact Assessment and Mitigation Planning. Table 3-689 summarizes the B2H Project and past and present actions and other RFFAs identified in the CIAA for Segment 1.

Table 3-689. Existing Cumulative Development for Wetlands in Segment 1—Morrow-Umatilla

Wetland Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Forested	• Aggregate/Mineral Mining • Residential and Other Structures • Cascade Natural Gas, Northwest Corp, and Other Gas Pipelines • CBE, Northwest Corp, Umatilla Electric Cooperative, and Other Electric Transmission Lines • Oregon Dams • Railroads • Roads	• None identified
Scrub-Shrub	• Aggregate/Mineral Mining • Residential and Other Structures • Cascade Natural Gas, Northwest Corp, and Other Gas Pipelines • CBE, Northwest Corp, Umatilla Electric Cooperative and Other Electric Transmission Lines • Power Substation • Railroads • Roads	• Wheatridge Wind Farm Utility • Wallula to McNary 230-kV PacifiCorp Transmission Line
Emergent	• Aggregate/Mineral Mining/Stockpile • Residential and Other Structures • Cascade Natural Gas, Northwest Corp, and Other Gas Pipelines • CBE, Northwest Corp, Umatilla Electric Cooperative, Oregon Wind, and Other Electric Transmission Lines • Oregon Dams • Railroads • Roads and rest stops	• Buttercreek Wind Turbines • Wheatridge Wind Farm Utility • Wallula to McNary 230-kV PacifiCorp Transmission Line
Open Water	• Aggregate – Extractive /Mineral Mining • Residential and Other Structures • Cascade Natural Gas, Perennial Wind Chaser, Northwest Corp, and Other Gas Pipelines • CBE, Northwest Corp, Umatilla Electric Cooperative and Other Electric Transmission Lines • Madison Farms Solar Project • Power Substation • Oregon Dams • Railroads • Campground • Roads and rest stop	• Buttercreek Wind Turbines • Wheatridge Wind Turbines • Wheatridge Wind Farm Utility • Wallula to McNary 230-kV PacifiCorp Transmission Line

The past and present actions and other RFFAs identified above in Table 3-689 include those used to quantitatively assess incremental wetland impacts in the CIAA for Segment 1 by wetland type. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 1 would contribute to and increase the cumulative impacts on all wetland types (refer to Table 3-690). Table 3-690 summarizes the extent of wetland types in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of

the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-690. Cumulative Effects Summary for Wetlands in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Forested							
Applicant's Proposed Action	17,399	398	0	291	689	16,710	42.3
Variation S1-B1	*976*	*4*	*0*	*1*	*5*	*971*	*13.2*
Variation S1-B2	*976*	*4*	*0*	*7*	*11*	*965*	*60.2*
East of Bombing Range Road	17,399	398	0	69	467	16,932	14.8
Applicant's Proposed Action – Southern Route	18,568	388	0	304	692	17,877	44.0
West of Bombing Range Road – Southern Route	22,367	449	0	307	757	21,610	40.6
Longhorn	21,542	425	0	56	481	21,060	11.7
Interstate 84	34,008	760	0	357	1,117	32,891	31.9
Variation S1-A1	*5,425*	*54*	*0*	*152*	*206*	*5,219*	*73.6*
Variation S1-A2	*4,160*	*54*	*0*	*4*	*58*	*4,102*	*6.4*
Interstate 84 – Southern Route	35,178	750	0	370	1,120	34,058	33.0
Scrub-Shrub							
Applicant's Proposed Action	18,605	195	0	298	493	18,112	60.5
Variation S1-B1	*1,034*	*7*	*0*	*1*	*7*	*1,027*	*8.9*
Variation S1-B2	*1,034*	*7*	*0*	*7*	*13*	*1,021*	*49.2*
East of Bombing Range Road	18,605	195	0	69	264	18,341	26.3
Applicant's Proposed Action – Southern Route	20,277	226	0	312	538	19,739	58.0
West of Bombing Range Road – Southern Route	24,872	313	29	313	655	24,217	47.8
Longhorn	22,563	203	0	61	264	22,299	23.2

Table 3-690. Cumulative Effects Summary for Wetlands in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	34,092	333	2	359	695	33,397	51.7
Variation S1-A1	*5,384*	*53*	*0*	*152*	*205*	*5,179*	*74.2*
Variation S1-A2	*4,119*	*53*	*0*	*6*	*59*	*4,060*	*10.8*
Interstate 84 – Southern Route	35,764	365	2	373	740	35,024	50.4
Emergent							
Applicant's Proposed Action	23,989	726	1	320	1,047	22,941	30.6
Variation S1-B1	*1,529*	*69*	*0*	*3*	*72*	*1,458*	*4.0*
Variation S1-B2	*1,529*	*69*	*0*	*7*	*76*	*1,454*	*8.7*
East of Bombing Range Road	23,989	726	1	99	826	23,162	12.0
Applicant's Proposed Action – Southern Route	25,212	775	1	330	1,106	24,106	29.8
West of Bombing Range Road – Southern Route	32,687	958	531	343	1,832	30,856	18.7
Longhorn	28,790	924	1	101	1,026	27,764	9.9
Interstate 84	43,044	1,721	8	381	2,110	40,934	18.1
Variation S1-A1	*6,737*	*144*	*0*	*152*	*296*	*6,440*	*51.3*
Variation S1-A2	*5,152*	*128*	*0*	*7*	*135*	*5,017*	*5.4*
Interstate 84 – Southern Route	44,267	1,770	8	391	2,169	42,098	18.0
Open Water							
Applicant's Proposed Action	46,152	1,773	3	329	2,104	44,048	15.6
Variation S1-B1	*4,119*	*88*	*0*	*1*	*89*	*4,030*	*0.7*
Variation S1-B2	*4,119*	*88*	*0*	*15*	*103*	*4,016*	*14.3*
East of Bombing Range Road	46,152	1,773	3	102	1,878	44,275	5.4
Applicant's Proposed Action – Southern Route	49,680	1,774	3	369	2,146	47,534	17.2
West of Bombing Range Road – Southern Route	55,344	1,978	161	378	2,517	52,827	15.0
Longhorn	53,160	2,100	3	91	2,193	50,967	4.1

Table 3-690. Cumulative Effects Summary for Wetlands in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	72,438	3,835	3	417	4,255	68,183	9.8
Variation S1-A1	*14,771*	*856*	*0*	*164*	*1,019*	*13,751*	*16.1*
Variation S1-A2	*12,939*	*764*	*0*	*22*	*786*	*12,153*	*2.8*
Interstate 84 – Southern Route	75,966	3,836	3	455	4,295	71,671	10.6

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in incremental disturbance to forested, scrub-shrub, emergent and open water wetlands, with the greatest incremental disturbance to scrub-shrub wetland types. Implementation of the Applicant's Proposed Action Alternative would contribute up to 40 percent of the estimated cumulative development on forested wetlands within the CIAA, 60 percent of the estimated cumulative development on scrub-shrub wetlands within the CIAA, 30 percent of the estimated cumulative development on emergent wetlands within the CIAA and 15 percent of the estimated cumulative develop on open water wetlands within the CIAA for Segment 1.

Of the alternatives considered in Segment 1, the Applicant's Proposed Action Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on forested, scrub-shrub, emergent and open water wetland types, and the East of Bombing Range Road Alternative would contribute the least amount of incremental disturbance relative to forested, scrub-shrub, emergent and open water wetland types within Segment 1 (refer to Table 3-688). The Interstate 84-Southern Route Alternative would contribute the greatest amount of incremental disturbance to forested, scrub-shrub, emergent and open water wetlands in Segment 1. The Longhorn Alternative would contribute the least amount of incremental disturbance to forested, scrub-shrub and open water wetlands and the East of Bombing Range Road Alternative would contribute the least amount of incremental disturbance to emergent wetlands within Segment 1. The East of Bombing Range Road Alternative would contribute substantially less incremental disturbance to forested, scrub-shrub, emergent and open water wetlands when compared to the Applicant's Proposed Action Alternative.

Past actions in the CIAA—such as development and continued use of agricultural fields, residential / commercial / industrial development, mining operations, wind-energy development, pipelines, and roads—have resulted in the loss or alteration of all wetland types in Segment 1. Conversion of emergent and scrub-shrub wetlands to agricultural fields has likely contributed to the largest loss of

these wetland types in Segment 1 in the Echo Marsh region near the Umatilla River. These activities, along with construction of the Buttercreek Wind Turbines, Wheatridge Wind Farm, Wallula to McNary 230-kV Transmission Line and associated access roads likely have contributed to permanent loss of wetlands and decrease in functional value of wetlands through impacts on water quality and vegetation management or removal as part of routine maintenance operations. Present actions also are likely to result in negative effects on existing wetlands, though it is assumed that wetland mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Restoration of degraded wetlands may provide functional lift of degraded wetlands; creation of wetlands through mitigation banking also may replace permanently lost wetlands, but only if the mitigation banks are created within the same subbasin area.

Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features, required federal and state permitting for permanent and temporary impacts on wetlands, use of wetland mitigation to offset direct loss, and the avoidance, or minimization of disturbance to wetlands is anticipated to limit cumulative effects on all wetland types in Segment 1.

Traditional Foods and Water Resources

Direct effects on water resources supporting traditional foods could result from ground-disturbing activities or construction of permanent or temporary features for the Proposed Action and all other alternative routes considered in Segment 1. Indirect effects reducing the availability and functionality of these resources could occur adjacent to disturbance through loss of temperature controlling streamside vegetation, increase in turbidity due to introduction of additional sediment or temporary loss of wetlands and riparian communities that provide water quality and temperature controlling factors to streams (refer to Section 3.2.2.6 for more detailed information).

In addition to the past and present actions in the CIAA identified in Table 3-687 and Table 3-689, conversion of wetlands and disturbance of water resources for agricultural or other development purposes has drastically reduced the availability of traditional foods in the CIAA.

Much of the habitat conversion has occurred in the western portion of Segment 1 in the area surrounding Pendleton, with most of the wetland and water resources that support traditional foods mostly occurring south and east of Pilot Rock. Past and present actions in the CIAA are likely to have similarly reduced the availability and functionality of water resources that support traditional foods through direct loss of wetlands, surface and ground water withdrawals associated with agricultural practices and development and introduction of impervious surfaces (thereby transporting pollutants and hazardous materials overland into adjacent wetlands and waters and affecting water quality and temperature).

Several RFFAs are identified in the CIAA for Segment 1; however, all are located west of Pendleton in areas largely converted for agricultural purposes and are unlikely to contribute to cumulative effects on traditional foods and water resources. B2H Project implementation would contribute to the cumulative effects on water quality and thermal regulation of streams supporting traditional foods. The extent of

cumulative effects on these water resources and wetlands is summarized in Table 3-688 and Table 3-690 and explained in greater detail in the analysis of cumulative effects on water resources.

In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of mapped water resources in the CIAA. The extent of cumulative effects on traditional foods would relate to the cumulative effects on both water quality and temperature. Several factors would affect the total cumulative effect on water resources, including the location of traditional food, relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 2—Blue Mountains

Streams

Permanent and temporary impacts on perennial and intermittent streams are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected streams through removal of streamside vegetation, construction of impervious surfaces that may lead untreated stormwater directly to streams, and disturbance to soils. No RFFAs were identified in the CIAA for Segment 2. Table 3-691 summarizes the past and present development in the CIAA for Segment 2.

Table 3-691. Existing Cumulative Development for Streams in Segment 2—Blue Mountains

Stream Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Perennial	• Active Mines (stone) • Elkhorn Wind Turbines • Electric Transmission Lines, Pipelines • Residential and Commercial Development • Roads and railroads • Dams • Campgrounds	• None identified
Intermittent	• Active Mines (stone) • Elkhorn Wind Turbines • Electric Transmission Lines, Pipelines • Residential and Commercial Development • Roads and railroads • Dams • Campgrounds	• None identified

The past and present development identified above includes those activities used to quantitatively assess incremental impacts on water quality in the CIAA for Segment 2. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 2 would contribute to and increase the cumulative impacts on intermittent and perennial streams. Table 3-692 summarizes the extent of perennial and intermittent streams in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-692. Cumulative Effects Summary for Streams in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Perennial Streams							
Applicant's Proposed Action	*22,493*	*631*	*0*	*54*	*685*	*21,808*	*7.9*
Variation S2-A1	*5,767*	*248*	*0*	*1*	*248*	*5,519*	*0.3*
Variation S2-A2	*5,767*	*248*	*0*	*0*	*248*	*5,519*	*0.2*
Variation S2-B1	*9,109*	*318*	*0*	*18*	*336*	*8,773*	*5.3*
Variation S2-B2	*9,109*	*318*	*0*	*18*	*337*	*8,772*	*5.5*
Variation S2-C1	*8,403*	*185*	*0*	*9*	*194*	*8,209*	*4.5*
Variation S2-C2	*12,018*	*277*	*0*	*17*	*295*	*11,724*	*5.9*
Variation S2-E1	*3,392*	*137*	*0*	*0*	*137*	*3,255*	*0.2*
Variation S2-E2	*3,392*	*137*	*0*	*4*	*140*	*3,251*	*2.6*
Variation S2-F1	*8,323*	*198*	*0*	*19*	*217*	*8,106*	*8.6*
Variation S2-F2	*8,323*	*198*	*0*	*28*	*226*	*8,097*	*12.3*
Glass Hill	22,493	631	0	61	692	21,802	8.8
Variation S2-D1	*5,625*	*109*	*0*	*15*	*125*	*5,500*	*12.3*
Variation S2-D2	*5,625*	*109*	*0*	*18*	*127*	*5,498*	*14.0*
Mill Creek	27,887	1,066	0	59	1,126	26,761	5.3
Intermittent Streams							
Applicant's Proposed Action	38,433	899	0	130	1,029	37,404	12.7
Variation S2-A1	*12,145*	*214*	*0*	*14*	*228*	*11,917*	*6.1*
Variation S2-A2	*12,145*	*214*	*0*	*27*	*242*	*11,903*	*11.4*
Variation S2-B1	*10,794*	*210*	*0*	*15*	*226*	*10,568*	*6.8*
Variation S2-B2	*10,794*	*210*	*0*	*18*	*229*	*10,565*	*8.0*
Variation S2-C1	*7,490*	*119*	*0*	*15*	*134*	*7,357*	*11.2*
Variation S2-C2	*11,315*	*183*	*0*	*11*	*195*	*11,120*	*5.9*
Variation S2-E1	*5,487*	*251*	*0*	*9*	*260*	*5,227*	*3.5*
Variation S2-E2	*5,487*	*251*	*0*	*6*	*257*	*5,230*	*2.4*
Variation S2-F1	*18,797*	*566*	*0*	*49*	*615*	*18,182*	*8.0*
Variation S2-F2	*18,797*	*566*	*0*	*36*	*602*	*18,195*	*6.0*
Glass Hill	38,433	899	0	128	1,027	37,406	12.5
Variation S2-D1	*4,213*	*63*	*0*	*16*	*79*	*4,135*	*20.3*
Variation S2-D2	*4,213*	*63*	*0*	*4*	*66*	*4,147*	*5.4*
Mill Creek	44,218	1,093	0	130	1,223	42,995	10.7

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in the greatest incremental disturbance to intermittent streams for all alternative routes, and is expected to contribute up to 12 percent of the estimated impacts from cumulative development. Incremental disturbance to perennial streams is anticipated to result from B2H Project implementation of the Applicant's Proposed Action Alternative, but would contribute up to 8 percent of the estimated cumulative development. Only a minimal amount of cumulative disturbance (less than 1 percent) to all perennial streams mapped in the CIAA would be anticipated.

Of the alternatives considered in Segment 2, the Mill Creek Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on perennial streams, and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on perennial streams. The Mill Creek Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on intermittent streams, and the Glass Hill Action would contribute the least amount of incremental disturbance relative to estimated cumulative development on intermittent streams (refer to Table 3-692).

Past actions in the CIAA—such as dryland farming, roads and railroads, the Elkhorn Wind Turbines, residential development and pipelines—have resulted in the degradation of water quality and water quantity. Use of ground and surface waters for irrigation of agriculture areas likely have contributed to the overall reduction in water availability. These activities, coupled with local active mining operations, construction of wind-energy facilities, pipelines and maintenance of associated access roads, have likely have contributed to thermal degradation of waters through the introduction of overland stormwater runoff or direct discharge releases prior to passage through vegetation, where natural cooling processes could lower ambient contributory water temperatures. The likely addition of overland stormwater runoff also may affect water quality with the introduction of pollutants and other hazardous materials present in impervious surfaces adjacent to or crossing stream resources. Present actions also are likely to result in negative effects on water quality, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features and out-of-bank stream spanning, avoidance, or minimization of disturbance to water resources is anticipated to limit cumulative effects on both perennial and intermittent streams.

Wetlands

Permanent and temporary impacts on wetlands and permitting requirements are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected wetlands through direct loss of wetland types, temporary impacts on wetlands through removal or crushing of vegetation and disturbance to soils. Impacts on wetlands vary by wetland type due to rates of recovery; forested wetlands would take longer to recover than emergent wetland types. Wetland mitigation required under federal and state permits, also may offset the total cumulative effects on wetland communities. The

degree of effectiveness of mitigation is variable and dependent on site conditions. Mitigation is discussed in detail in Section 3.2.2.4 – Impact Assessment and Mitigation Planning. No RFFAs were identified in the CIAA for Segment 2. Table 3-693 summarizes the past and present development identified in the CIAA for Segment 2.

Table 3-693. Existing Cumulative Development for Wetlands in Segment 2—Blue Mountains

Wetlands Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Forested	• Roads and railroads • Pipelines • Non-residential buildings and outstructures	• None identified
Scrub-Shrub	• Active mines • Roads and railroads • Pipelines and transmission lines • Non-residential buildings and outstructures • Dams	• None identified
Emergent	• Active mines (stone) • Roads and railroads • Pipelines and transmission lines • Non-residential buildings and outstructures • Schools and residential buildings • Dams	• None identified
Open Water	• Active mines (stone) • Roads and railroads • Pipelines and transmission lines • Non-residential buildings and outstructures • Schools and residential buildings • Campgrounds • Dams	• None identified

The past and present actions and other RFFAs identified above in Table 3-693 include those used to quantitatively assess incremental wetland impacts in the CIAA for Segment 2 by wetland type. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 2 would contribute to and increase the cumulative impacts on all wetland types. Table 3-694 summarizes the extent of wetland types in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-694. Cumulative Effects Summary for Wetlands in Segment 2—Blue Mountains in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Forested							
Applicant's Proposed Action	4,068	44	0	9	53	4,015	17.5
Variation S2-A1	*736*	*5*	*0*	*1*	*6*	*730*	*11.3*
Variation S2-A2	*736*	*5*	*0*	*0*	*5*	*731*	*7.8*
Variation S2-B1	*1,125*	*7*	*0*	*1*	*8*	*1,117*	*8.5*
Variation S2-B2	*1,125*	*7*	*0*	*1*	*8*	*1,116*	*10.7*
Variation S2-C1	*835*	*2*	*0*	*2*	*4*	*830*	*40.1*
Variation S2-C2	*4,062*	*39*	*0*	*3*	*42*	*4,020*	*8.2*
Variation S2-E1	*657*	*1*	*0*	*0*	*1*	*656*	*18.2*
Variation S2-E2	*657*	*1*	*0*	*0*	*1*	*656*	*18.0*
Variation S2-F1	*2,498*	*36*	*0*	*4*	*40*	*2,457*	*9.6*
Variation S2-F2	*2,498*	*36*	*0*	*4*	*41*	*2,457*	*10.7*
Glass Hill	4,068	44	0	9	53	4,016	16.9
Variation S2-D1	*629*	*2*	*0*	*1*	*3*	*626*	*16.9*
Variation S2-D2	*629*	*2*	*0*	*0*	*3*	*626*	*16.2*
Mill Creek	8,785	128	0	15	143	8,642	10.5
Scrub-Shrub							
Applicant's Proposed Action	7,324	195	0	24	219	7,104	10.9
Variation S2-A1	*1,183*	*65*	*0*	*1*	*65*	*1,117*	*1.0*
Variation S2-A2	*1,183*	*65*	*0*	*0*	*65*	*1,118*	*0.6*
Variation S2-B1	*1,706*	*71*	*0*	*1*	*72*	*1,634*	*1.0*
Variation S2-B2	*1,706*	*71*	*0*	*1*	*72*	*1,634*	*1.2*
Variation S2-C1	*1,021*	*9*	*0*	*2*	*10*	*1,011*	*15.9*
Variation S2-C2	*4,380*	*58*	*0*	*8*	*66*	*4,315*	*11.5*
Variation S2-E1	*1,103*	*50*	*0*	*0*	*50*	*1,053*	*0.5*
Variation S2-E2	*1,103*	*50*	*0*	*3*	*53*	*1,050*	*5.5*
Variation S2-F1	*5,120*	*122*	*0*	*17*	*139*	*4,980*	*12.5*
Variation S2-F2	*5,120*	*122*	*0*	*5*	*127*	*4,993*	*3.8*
Glass Hill	7,324	195	0	30	225	7,098	13.2
Variation S2-D1	*795*	*7*	*0*	*3*	*10*	*785*	*28.8*
Variation S2-D2	*795*	*7*	*0*	*3*	*10*	*785*	*32.9*
Mill Creek	12,456	320	0	20	340	12,116	5.8

Table 3-694. Cumulative Effects Summary for Wetlands in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Emergent							
Applicant's Proposed Action	11,544	442	0	37	479	11,064	7.7
Variation S2-A1	*1,268*	*52*	*0*	*1*	*53*	*1,216*	*1.2*
Variation S2-A2	*1,268*	*52*	*0*	*0*	*52*	*1,216*	*0.8*
Variation S2-B1	*2,840*	*80*	*0*	*9*	*89*	*2,751*	*10.3*
Variation S2-B2	*2,840*	*80*	*0*	*1*	*81*	*2,759*	*1.1*
Variation S2-C1	*2,275*	*41*	*0*	*4*	*45*	*2,230*	*8.5*
Variation S2-C2	*7,794*	*607*	*0*	*3*	*610*	*7,183*	*0.6*
Variation S2-E1	*1,377*	*137*	*0*	*0*	*137*	*1,240*	*0.2*
Variation S2-E2	*1,377*	*137*	*0*	*3*	*140*	*1,237*	*2.4*
Variation S2-F1	*8,000*	*349*	*0*	*20*	*369*	*7,630*	*5.5*
Variation S2-F2	*8,000*	*349*	*0*	*10*	*359*	*7,641*	*2.8*
Glass Hill	11,544	442	0	39	481	11,062	8.2
Variation S2-D1	*1,877*	*32*	*0*	*1*	*32*	*1,845*	*1.6*
Variation S2-D2	*1,877*	*32*	*0*	*0*	*32*	*1,845*	*1.5*
Mill Creek	21,707	1,292	0	33	1,325	20,382	2.5
Open Water							
Applicant's Proposed Action	18,608	603	0	59	661	17,947	8.9
Variation S2-A1	*3,466*	*188*	*0*	*1*	*189*	*3,277*	*0.3*
Variation S2-A2	*3,466*	*188*	*0*	*3*	*191*	*3,275*	*1.4*
Variation S2-B1	*6,143*	*234*	*0*	*14*	*248*	*5,896*	*5.5*
Variation S2-B2	*6,143*	*234*	*0*	*14*	*249*	*5,895*	*5.8*
Variation S2-C1	*5,937*	*130*	*0*	*6*	*136*	*5,801*	*4.2*
Variation S2-C2	*10,829*	*401*	*0*	*8*	*409*	*10,420*	*2.1*
Variation S2-E1	*2,713*	*164*	*0*	*3*	*167*	*2,545*	*2.0*
Variation S2-E2	*2,713*	*164*	*0*	*0*	*164*	*2,549*	*0.1*
Variation S2-F1	*9,206*	*284*	*0*	*25*	*309*	*8,896*	*8.1*
Variation S2-F2	*9,206*	*284*	*0*	*26*	*311*	*8,895*	*8.5*
Glass Hill	18,608	603	0	56	659	17,949	8.6
Variation S2-D1	*4,354*	*78*	*0*	*9*	*87*	*4,267*	*10.2*
Variation S2-D2	*4,354*	*78*	*0*	*12*	*90*	*4,264*	*13.1*
Mill Creek	25,713	1,144	0	65	1,208	24,505	5.3

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in incremental disturbance to forested, scrub-shrub, emergent and open water wetlands, with the greatest incremental disturbance to forested wetland types. Implementation of the Applicant's Proposed Action Alternative would contribute up to 18 percent of the estimated cumulative development on forested wetlands in the CIAA, 11 percent of the estimated cumulative development on scrub-shrub wetlands in the CIAA, 8 percent of the estimated cumulative development on emergent wetlands within the CIAA and 9 percent of the estimated cumulative develop on open water wetlands within the CIAA for Segment 2.

Of the alternatives considered in Segment 2, the Applicant's Proposed Action Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on forested, scrub-shrub, emergent and open water wetland types, and the Mill Creek Alternative would contribute the least amount of incremental disturbance relative to forested, scrub-shrub, emergent and open water wetland types within Segment 2 (refer to Table 3-694).

Past actions in the CIAA—such as development and continued use of dryland farming, irrigated agricultural fields, mining operations and roads—have resulted in the loss or alteration of all wetland types in Segment 2. Conversion of emergent and scrub-shrub wetlands to agricultural fields has likely contributed to the largest loss of these wetland types in Segment 2 in the Clover Creek Valley near Clover Creek. These activities, along with use and maintenance of access roads in the Ladd Marsh Wildlife Area and the Wallowa-Whitman National Forest likely have contributed to permanent loss of wetlands and decrease in functional value of wetlands through impacts on water quality and vegetation management or removal as part of routine maintenance operations. Present actions also are likely to result in negative effects on existing wetlands, though it is assumed that wetland mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Restoration of degraded wetlands may provide functional lift of degraded wetlands; creation of wetlands through mitigation banking also may replace permanently lost wetlands, but only if the mitigation banks are created within the same subbasin area.

Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features, required federal and state permitting for permanent and temporary impacts on wetlands, use of wetland mitigation to offset direct loss, and the avoidance, or minimization of disturbance to wetlands is anticipated to limit cumulative effects on all wetland types within Segment 2.

Traditional Foods and Water Resources

Direct and indirect effects on water resources supporting traditional foods are anticipated to be similar to that described for Segment 1.

In addition to the past and present actions in the CIAA identified in Table 3-691 and Table 3-693 (Existing Cumulative Development for Streams / Wetlands within Segment 2 – Blue Mountains), loss of wetlands and water resource due to construction of roads for energy or other development purposes has reduced the availability of traditional foods in the CIAA.

Much of the habitat conversion has occurred in the southeastern portion of Segment 2 in the Clover Creek Valley and surrounding floodplain. Past and present actions in the CIAA are likely to have similarly reduced the availability and functionality of water resources that support traditional foods through direct loss of wetlands, surface and ground water withdrawals associated with agricultural practices and development and introduction of impervious surfaces (thereby transporting pollutants and hazardous materials overland into adjacent wetlands and waters and affecting water quality and temperature).

In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of mapped water resources in the CIAA. The extent of cumulative effects on traditional foods would relate to the cumulative effects on both water quality and temperature. Several factors would affect the total cumulative effect on water resources, including the location of traditional food, relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 3—Baker Valley

Streams

Permanent and temporary impacts on perennial and intermittent streams are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected streams through removal of streamside vegetation, construction of impervious surfaces that may lead untreated stormwater directly to streams, and disturbance to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on streams, though it is assumed these RFFAs would take similar steps to avoid, minimize, and mitigate potential impacts on water quality of streams. Table 3-695 summarizes the past and present actions and other RFFAs identified in the CIAA for Segment 3.

Table 3-695. Existing Cumulative Development for Streams in Segment 3— Baker Valley

Stream Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Perennial	• Active mines (stone, metals) • Extractive mining • Campground • Communication Towers • Dams • Pipelines and Transmission Lines • Railroads and Roads • Rest stops • Schools and Residential Development	• Active Mining (aggregate)

Table 3-695. Existing Cumulative Development for Streams in Segment 3— Baker Valley		
Stream Type	**Past and Present Actions**	**Reasonably Foreseeable Future Actions**
Intermittent	• Active mines (stone, metals) • Extractive mining • Campground • Communication Facilities and Towers • Dams • Pipelines and Transmission Lines • Railroads and Roads • Rest stops • Schools and Residential Development	• Active Mining (aggregate)

The past and present development identified above includes those used to quantitatively assess incremental water quality impacts in the CIAA for Segment 3. Active mines, linear transportation facilities, including roads and pipelines and electric transmission lines, constitute the bulk of past and present development in the Segment 3 CIAA.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 3 would contribute to and increase the cumulative impacts on intermittent and perennial streams. Table 3-696 summarizes the extent of perennial and intermittent streams in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-696. Cumulative Effects Summary for Streams in Segment 3—Baker Valley in Acres							
Alternative Route	**Total Available Resource**	**No Action Alternative**		**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**	**Percent of Project Impact**
		Past and Present Development	**Reasonably Foreseeable Future Actions**				
Perennial Streams							
Applicant's Proposed Action	34,105	1,326	0	150	1,476	32,629	10.2
Variation S3-A1	*6,401*	*97*	*0*	*23*	*120*	*6,281*	*19.3*
Variation S3-A2	*8,179*	*113*	*0*	*4*	*117*	*8,062*	*3.7*
Variation S3-B1	*10,795*	*284*	*0*	*20*	*304*	*10,491*	*6.6*
Variation S3-B2	*11,878*	*428*	*0*	*21*	*450*	*11,428*	*4.8*
Variation S3-B3	*11,878*	*428*	*0*	*24*	*453*	*11,425*	*5.4*
Variation S3-B4	*11,878*	*428*	*0*	*19*	*448*	*11,431*	*4.3*
Variation S3-B5	*11,878*	*428*	*0*	*14*	*442*	*11,436*	*3.1*
Variation S3-C1	*17,615*	*878*	*0*	*104*	*982*	*16,633*	*10.6*
Variation S3-C2	*17,615*	*878*	*0*	*107*	*985*	*16,630*	*10.9*
Variation S3-C3	*12,576*	*800*	*0*	*128*	*928*	*11,647*	*13.8*
Variation S3-C4	*12,576*	*800*	*0*	*113*	*914*	*11,662*	*12.4*

Table 3-696. Cumulative Effects Summary for Streams in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C5	*12,576*	*800*	*0*	*47*	*847*	*11,728*	*5.5*
Variation S3-C6	*11,154*	*360*	*0*	*60*	*420*	*10,734*	*14.3*
Flagstaff A	35,188	1,470	0	143	1,613	33,575	8.9
Timber Canyon	52,695	1,549	0	216	1,765	50,930	12.2
Flagstaff A – Burnt River Mountain	30,149	1,392	0	164	1,557	28,592	10.6
Flagstaff B	35,188	1,470	0	154	1,624	33,564	9.5
Flagstaff B – Burnt River West	31,927	1,408	0	80	1,488	30,439	5.4
Flagstaff B – Durkee	28,727	952	0	114	1,065	27,662	10.7
Intermittent Streams							
Applicant's Proposed Action	55,632	1,111	0	244	1,355	54,277	18.0
Variation S3-A1	*12,887*	*302*	*0*	*43*	*345*	*12,542*	*12.5*
Variation S3-A2	*16,260*	*333*	*0*	*43*	*376*	*15,884*	*11.4*
Variation S3-B1	*18,400*	*336*	*0*	*22*	*358*	*18,042*	*6.3*
Variation S3-B2	*9,580*	*156*	*0*	*72*	*228*	*9,352*	*31.4*
Variation S3-B3	*9,580*	*156*	*0*	*66*	*222*	*9,357*	*29.7*
Variation S3-B4	*9,580*	*156*	*0*	*54*	*210*	*9,370*	*25.7*
Variation S3-B5	*9,580*	*156*	*0*	*59*	*215*	*9,365*	*27.4*
Variation S3-C1	*24,093*	*386*	*0*	*137*	*523*	*23,570*	*26.1*
Variation S3-C2	*24,093*	*386*	*0*	*146*	*533*	*23,560*	*27.5*
Variation S3-C3	*19,179*	*340*	*0*	*185*	*525*	*18,654*	*35.2*
Variation S3-C4	*19,179*	*340*	*0*	*172*	*512*	*18,667*	*33.6*
Variation S3-C5	*19,179*	*340*	*0*	*109*	*449*	*18,730*	*24.4*
Variation S3-C6	*21,220*	*209*	*0*	*155*	*364*	*20,856*	*42.6*
Flagstaff A	46,812	931	0	280	1,212	45,600	23.1
Timber Canyon	73,186	1,072	0	385	1,456	71,730	26.4
Flagstaff A – Burnt River Mountain	41,898	885	0	325	1,209	40,688	26.8
Flagstaff B	46,812	931	0	288	1,219	45,593	23.6
Flagstaff B – Burnt River West	45,270	916	0	264	1,179	44,091	22.4
Flagstaff B – Durkee	43,940	754	0	307	1,061	42,879	28.9

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in the greatest incremental disturbance to intermittent streams for all alternative routes and is expected to contribute up to 18 percent of the estimated impacts from cumulative development on intermittent streams. Incremental disturbance on perennial streams is anticipated to result from B2H Project implementation

of the Applicant's Proposed Action Alternative, but would contribute up to 10 percent of the estimated cumulative development. Only a minimal amount of cumulative disturbance (less than 1 percent) to all perennial streams mapped in the CIAA would be anticipated.

Of the alternatives considered in Segment 3, the Timber Canyon Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on perennial streams, and the Flagstaff B – Burnt River West Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on perennial streams. The Flagstaff B – Durkee Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on intermittent streams, and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on intermittent streams (refer to Table 3-696).

Past actions in the CIAA—such as dryland farming, roads and railroads, residential development and pipelines—have resulted in the degradation of water quality and water quantity. Use of ground and surface waters for irrigation of agriculture areas in the Baker Valley and Missouri Flats areas and floodplains along the Powder River likely have contributed to the overall reduction in water availability. These activities, coupled with active mining operations, pipelines and maintenance of associated access roads, have likely have contributed to thermal degradation of waters through the introduction of overland stormwater runoff or direct discharge releases prior to passage through vegetation, where natural cooling processes could lower ambient contributory water temperatures. The likely addition of overland stormwater runoff also may affect water quality with the introduction of pollutants and other hazardous materials present in impervious surfaces adjacent to or crossing stream resources. Present actions also are likely to result in negative effects on water quality, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features and out-of-bank stream spanning, avoidance, or minimization of disturbance to water resources is anticipated to limit cumulative effects on both perennial and intermittent streams.

Wetlands

Permanent and temporary impacts on wetlands and permitting requirements are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected wetlands through direct loss of wetland types, temporary impacts on wetlands through removal or crushing of vegetation and disturbance to soils. Impacts on wetlands vary by wetland type due to rates of recovery; forested wetlands would take longer to recover than emergent wetland types. Construction of several RFFAs in the CIAA, including active aggregate mines, would result in similar cumulative effects on wetlands, though it is assumed these RFFAs would take similar steps to avoid, minimize, and mitigate potential impacts on wetlands. Wetland mitigation required under federal and state permits, also may offset the total cumulative effects on wetland communities. The degree of effectiveness of mitigation is variable and dependent on site conditions. Mitigation is discussed in detail in Section 3.2.2.4 – Impact

Assessment and Mitigation Planning. Table 3-697 summarizes the past and present actions and other RFFAs identified in the CIAA for Segment 3.

Table 3-697. Existing Cumulative Development for Wetlands in Segment 3—Baker Valley

Wetlands Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Forested	• Active mines (metals, stone) • Campgrounds • Communication Towers • Extractive mining • Dams • Pipelines and Transmission Lines • Roads and railroads • Schools and Residential Development	Active aggregate mining
Scrub-Shrub	• Active mines (metals) • Communication Towers • Extractive mining • Dams • Pipelines and Transmission Lines • Roads and railroads • Residential Development	Active aggregate mining
Emergent	• Active mines (element, metals, stone) • Communication Towers • Extractive mining • Dams • Pipelines and Transmission Lines • Roads and railroads • Schools and Residential Development	Active aggregate mining
Open Water	• Active mines (metals, stone) • Campgrounds • Communication Facilities and Towers • Extractive mining • Dams • Pipelines and Transmission Lines • Rest stops, roads and railroads • Schools and Residential Development	Active aggregate mining

The past and present actions and other RFFAs identified above in Table 3-697 include those used to quantitatively assess incremental wetland impacts in the CIAA for Segment 3 by wetland type. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 3 would contribute to and increase the cumulative impacts on all wetland types. Table 3-698 summarizes the extent of wetland types in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-698. Cumulative Effects Summary for Wetlands in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Forested							
Applicant's Proposed Action	14,850	485	0	101	586	14,265	17.3
Variation S3-A1	*3,120*	*26*	*0*	*1*	*27*	*3,092*	*5.3*
Variation S3-A2	*3,454*	*27*	*0*	*1*	*28*	*3,426*	*3.7*
Variation S3-B1	*3,810*	*30*	*0*	*5*	*35*	*3,775*	*14.2*
Variation S3-B2	*4,610*	*31*	*0*	*8*	*38*	*4,571*	*20.4*
Variation S3-B3	*4,610*	*31*	*0*	*11*	*42*	*4,568*	*27.2*
Variation S3-B4	*4,610*	*31*	*0*	*10*	*40*	*4,570*	*23.9*
Variation S3-B5	*4,610*	*31*	*0*	*4*	*35*	*4,575*	*11.2*
Variation S3-C1	*8,080*	*342*	*0*	*99*	*441*	*7,639*	*22.4*
Variation S3-C2	*8,080*	*342*	*0*	*104*	*447*	*7,633*	*23.3*
Variation S3-C3	*5,503*	*311*	*0*	*118*	*428*	*5,075*	*27.4*
Variation S3-C4	*5,503*	*311*	*0*	*119*	*429*	*5,074*	*27.6*
Variation S3-C5	*5,503*	*311*	*0*	*21*	*332*	*5,171*	*6.4*
Variation S3-C6	*4,790*	*201*	*0*	*37*	*238*	*4,552*	*15.6*
Flagstaff A	15,650	485	0	100	585	15,065	17.0
Timber Canyon	16,208	348	0	134	482	15,726	27.8
Flagstaff A – Burnt River Mountain	13,074	454	0	116	570	12,504	20.3
Flagstaff B	15,650	485	0	107	592	15,058	18.0
Flagstaff B – Burnt River West	13,407	455	0	34	488	12,919	6.9
Flagstaff B – Durkee	12,361	344	0	48	393	11,968	12.3
Scrub-Shrub							
Applicant's Proposed Action	11,853	271	0	101	373	11,480	27.1
Variation S3-A1	*3,719*	*33*	*0*	*1*	*34*	*3,685*	*4.3*
Variation S3-A2	*4,817*	*37*	*0*	*1*	*39*	*4,779*	*2.7*
Variation S3-B1	*3,245*	*32*	*0*	*5*	*37*	*3,208*	*13.4*
Variation S3-B2	*4,307*	*36*	*0*	*8*	*44*	*4,262*	*17.7*
Variation S3-B3	*4,307*	*36*	*0*	*11*	*48*	*4,259*	*23.9*
Variation S3-B4	*4,307*	*36*	*0*	*10*	*46*	*4,260*	*20.9*
Variation S3-B5	*4,307*	*36*	*0*	*4*	*40*	*4,266*	*9.6*
Variation S3-C1	*5,529*	*209*	*0*	*99*	*308*	*5,221*	*32.0*
Variation S3-C2	*5,529*	*209*	*0*	*107*	*316*	*5,212*	*33.9*
Variation S3-C3	*5,094*	*191*	*0*	*120*	*311*	*4,783*	*38.5*
Variation S3-C4	*5,094*	*191*	*0*	*120*	*311*	*4,783*	*38.5*

Table 3-698. Cumulative Effects Summary for Wetlands in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C5	*5,094*	*191*	*0*	*9*	*200*	*4,894*	*4.3*
Variation S3-C6	*3,345*	*38*	*0*	*19*	*57*	*3,288*	*33.7*
Flagstaff A	12,914	276	0	100	375	12,539	26.5
Timber Canyon	21,135	500	0	150	650	20,485	23.1
Flagstaff A – Burnt River Mountain	12,480	258	0	118	376	12,104	31.3
Flagstaff B	12,914	276	0	107	383	12,532	27.9
Flagstaff B – Burnt River West	13,578	263	0	23	286	13,292	8.1
Flagstaff B – Durkee	10,730	105	0	33	138	10,593	24.1
Emergent							
Applicant's Proposed Action	30,538	997	0	162	1,159	29,379	14.0
Variation S3-A1	*13,232*	*473*	*0*	*23*	*496*	*12,736*	*4.6*
Variation S3-A2	*14,820*	*497*	*0*	*6*	*503*	*14,317*	*1.1*
Variation S3-B1	*11,106*	*266*	*0*	*5*	*271*	*10,835*	*1.8*
Variation S3-B2	*17,243*	*502*	*0*	*31*	*534*	*16,710*	*5.9*
Variation S3-B3	*17,243*	*502*	*0*	*34*	*537*	*16,707*	*6.4*
Variation S3-B4	*17,243*	*502*	*0*	*29*	*531*	*16,712*	*5.4*
Variation S3-B5	*17,243*	*502*	*0*	*35*	*537*	*16,706*	*6.5*
Variation S3-C1	*10,136*	*330*	*0*	*113*	*443*	*9,693*	*25.6*
Variation S3-C2	*10,136*	*330*	*0*	*115*	*445*	*9,691*	*25.9*
Variation S3-C3	*8,302*	*296*	*0*	*156*	*451*	*7,851*	*34.5*
Variation S3-C4	*8,302*	*296*	*0*	*134*	*430*	*7,873*	*31.2*
Variation S3-C5	*8,302*	*296*	*0*	*16*	*312*	*7,990*	*5.3*
Variation S3-C6	*6,367*	*176*	*0*	*21*	*197*	*6,170*	*10.6*
Flagstaff A	36,676	1,234	0	192	1,425	35,250	13.4
Timber Canyon	33,451	801	0	204	1,005	32,446	20.3
Flagstaff A – Burnt River Mountain	34,843	1,200	0	230	1,430	33,413	16.1
Flagstaff B	36,676	1,234	0	190	1,424	35,252	13.4
Flagstaff B – Burnt River West	36,431	1,224	0	85	1,309	35,122	6.5
Flagstaff B – Durkee	32,908	1,080	0	109	1,190	31,718	9.2
Open Water							
Applicant's Proposed Action	47,451	1,594	0	152	1,746	45,705	8.7
Variation S3-A1	*12,115*	*476*	*0*	*20*	*497*	*11,619*	*4.1*
Variation S3-A2	*14,820*	*499*	*0*	*19*	*518*	*14,303*	*3.6*

Table 3-698. Cumulative Effects Summary for Wetlands in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-B1	*16,255*	*505*	*0*	*21*	*526*	*15,729*	*4.0*
Variation S3-B2	*13,780*	*609*	*0*	*40*	*649*	*13,131*	*6.2*
Variation S3-B3	*13,780*	*609*	*0*	*42*	*651*	*13,129*	*6.5*
Variation S3-B4	*13,780*	*609*	*0*	*41*	*650*	*13,130*	*6.3*
Variation S3-B5	*13,780*	*609*	*0*	*34*	*643*	*13,137*	*5.3*
Variation S3-C1	*20,746*	*676*	*0*	*93*	*769*	*19,977*	*12.1*
Variation S3-C2	*20,746*	*676*	*0*	*103*	*778*	*19,968*	*13.2*
Variation S3-C3	*17,324*	*690*	*0*	*151*	*841*	*16,483*	*17.9*
Variation S3-C4	*17,324*	*690*	*0*	*141*	*831*	*16,493*	*16.9*
Variation S3-C5	*17,324*	*690*	*0*	*89*	*780*	*16,544*	*11.5*
Variation S3-C6	*15,929*	*305*	*0*	*120*	*425*	*15,505*	*28.2*
Flagstaff A	44,976	1,698	0	165	1,863	43,113	8.9
Timber Canyon	48,612	1,383	0	203	1,586	47,026	12.8
Flagstaff A – Burnt River Mountain	41,554	1,713	0	217	1,930	39,624	11.3
Flagstaff B	44,976	1,698	0	174	1,872	43,104	9.3
Flagstaff B – Burnt River West	44,259	1,735	0	167	1,903	42,356	8.8
Flagstaff B – Durkee	40,159	1,327	0	197	1,524	38,635	12.9

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in incremental disturbance to forested, scrub-shrub, emergent and open water wetlands, with the greatest incremental disturbance to scrub-shrub wetland types. Implementation of the Applicant's Proposed Action Alternative would contribute up to 17 percent of the estimated cumulative development on forested wetlands in the CIAA, 27 percent of the estimated cumulative development on scrub-shrub wetlands in the CIAA, 14 percent of the estimated cumulative development on emergent wetlands in the CIAA and 9 percent of the estimated cumulative develop on open water wetlands in the CIAA for Segment 3.

Of the alternatives considered in Segment 3, the Timber Canyon Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on forested wetland types and the Flagstaff B – Burnt River West Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on forested wetland types. The Flagstaff A – Burnt River Mountain Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on scrub-shrub wetland types, and the Flagstaff B – Burnt River West Alternative would contribute the least amount of incremental disturbance

relative to estimated cumulative development on scrub-shrub wetland types in Segment 3. The Timber Canyon Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on emergent wetland types and the Flagstaff B – Burnt River West Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on emergent wetland types in Segment 3. The Flagstaff B – Durkee Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on open water wetland types and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on open water wetland types in Segment 3 (Table 3-698).

Past actions in the CIAA—such as development and dryland farming, irrigated agricultural fields, mining operations and roads—have resulted in the loss or alteration of all wetland types in Segment 3. Conversion of emergent wetlands to agricultural fields has likely contributed to the largest loss of these wetland types in Segment 3 in the Powder River Valley and Baker Valley floodplains. These activities, along with use and maintenance of access roads in the Wallowa-Whitman National Forest and Powder River valley floodplain areas likely have contributed to permanent loss of wetlands and decrease in functional value of wetlands through impacts on water quality and vegetation management or removal as part of routine maintenance operations. Present actions also are likely to result in negative effects on existing wetlands, though it is assumed that wetland mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Restoration of degraded wetlands may provide functional lift of degraded wetlands; creation of wetlands through mitigation banking also may replace permanently lost wetlands, but only if the mitigation banks are created in the same subbasin area.

Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features, required federal and state permitting for permanent and temporary impacts on wetlands, use of wetland mitigation to offset direct loss, and the avoidance, or minimization of disturbance to wetlands is anticipated to limit cumulative effects on all wetland types in Segment 3.

Traditional Foods and Water Resources

Direct and indirect effects on water resources supporting traditional foods are anticipated to be similar to that described for Segment 1.

In addition to the past and present actions in the CIAA identified in Table 3-695 and Table 3-697, loss of wetlands and water resource due to construction of roads for energy or other development purposes has reduced the availability of traditional foods in the CIAA.

Much of the habitat conversion has occurred in the Baker Valley and Powder River valley areas, with most of the wetland and water resources that support traditional foods mostly occurring in areas of agricultural cultivation. Past and present actions in the CIAA are likely to have similarly reduced the availability and functionality of water resources that support traditional foods through direct loss of wetlands, surface and ground water withdrawals associated with agricultural practices and

development and introduction of impervious surfaces (thereby transporting pollutants and hazardous materials overland into adjacent wetlands and waters and affecting water quality and temperature).

Several RFFAs are identified in the CIAA for Segment 3; however, most located west of Baker City in areas associated with dry hillsides and are unlikely to contribute to cumulative effects on traditional foods and water resources. B2H Project implementation would contribute to the cumulative effects on water quality and thermal regulation of streams supporting traditional foods. The extent of cumulative effects on these water resources and wetlands is summarized in Table 3-696 and Table 3-698 and explained in greater detail in the analysis of cumulative effects on water resources.

In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of mapped water resources in the CIAA. The extent of cumulative effects on traditional foods would relate to the cumulative effects on both water quality and temperature. Several factors would affect the total cumulative effect on water resources, including the location of traditional food, relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 4—Brogan

Streams

Permanent and temporary impacts on perennial and intermittent streams are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected streams through removal of streamside vegetation, construction of impervious surfaces that may lead untreated stormwater directly to streams, and disturbance to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on streams, though it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on water quality of streams. Table 3-699 summarizes the past and present actions and other RFFAs identified in the CIAA for Segment 4.

Table 3-699. Existing Cumulative Development for Streams in Segment 4—Brogan

Stream Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Perennial	• Active Mines (Metals, stone) • Communication Towers • Flood Control Facilities, Dams • Huntington Wind Turbines • Pipelines, Electric Transmission Lines • Roads • Residential Development	• Oil and Gas Development • Active mines

Table 3-699. Existing Cumulative Development for Streams in Segment 4—Brogan		
Stream Type	**Past and Present Actions**	**Reasonably Foreseeable Future Actions**
Intermittent	• Active Mines (Metals, geothermal, stone) • Communication Towers • Extractive Mining • Flood Control Facilities, Dams • Huntington Wind Turbines • Pipelines, Electric Transmission Lines • Roads and Railroads • Residential Development	• Oil and Gas Development • Active mines

The past and present development identified above includes those used to quantitatively assess incremental water quality impacts in the CIAA for Segment 4. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 4 would contribute to and increase the cumulative impacts on intermittent and perennial streams. Table 3-700 summarizes the extent of perennial and intermittent streams in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-700. Cumulative Effects Summary for Streams in Segment 4—Brogan in Acres							
Alternative Route	**Total Available Resource**	**No Action Alternative**		**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**	**Percent of Project Impact**
		Past and Present Development	**Reasonably Foreseeable Future Actions**				
Perennial Streams							
Applicant's Proposed Action	20,848	803	0	46	850	19,998	5.5
Variation S4-A1	*6,818*	*434*	*0*	*14*	*448*	*6,370*	*3.1*
Variation S4-A2	*6,818*	*434*	*0*	*15*	*449*	*6,369*	*3.3*
Variation S4-A3	*6,818*	*434*	*0*	*15*	*449*	*6,368*	*3.3*
Tub Mountain South	24,393	977	0	49	1,026	23,367	4.8
Willow Creek	15,631	658	0	36	694	14,937	5.2
Intermittent Streams							
Applicant's Proposed Action	85,549	1,300	0	258	1,558	83,991	16.5
Variation S4-A1	*8,049*	*161*	*0*	*15*	*176*	*7,873*	*8.4*
Variation S4-A2	*8,049*	*161*	*0*	*10*	*172*	*7,877*	*6.1*
Variation S4-A3	*8,049*	*161*	*0*	*10*	*171*	*7,878*	*5.8*
Tub Mountain South	70,503	1,578	0	205	1,783	68,720	11.5
Willow Creek	56,863	872	0	205	1,078	55,785	19.0

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Of the alternatives considered in Segment 4, the Applicant's Proposed Action Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on perennial streams, and the Willow Creek Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on perennial streams. The Willow Creek Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on intermittent streams, and the Tub Mountain South Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on intermittent streams (Table 3-700).

Past actions in the CIAA—such as dryland farming, roads and railroads, residential development and pipelines—have resulted in the degradation of water quality and water quantity. Use of ground and surface waters for irrigation of agriculture areas in the Willow Creek Valley likely have contributed to the overall reduction in water availability. These activities, coupled with oil and gas development, active mining operations and maintenance of associated access roads, have likely have contributed to thermal degradation of waters through the introduction of overland stormwater runoff or direct discharge releases prior to passage through vegetation, where natural cooling processes could lower ambient contributory water temperatures. The likely addition of overland stormwater runoff also may affect water quality with the introduction of pollutants and other hazardous materials present in impervious surfaces adjacent to or crossing stream resources. Present actions also are likely to result in negative effects on water quality, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features and out-of-bank stream spanning, avoidance, or minimization of disturbance to water resources is anticipated to limit cumulative effects on both perennial and intermittent streams.

Wetlands

Permanent and temporary impacts on wetlands and permitting requirements are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected wetlands through direct loss of wetland types, temporary impacts on wetlands through removal or crushing of vegetation and disturbance to soils. Impacts on wetlands vary by wetland type due to rates of recovery; forested wetlands would take longer to recover than emergent wetland types. Wetland mitigation required under federal and state permits, also may offset the total cumulative effects on wetland communities. The degree of effectiveness of mitigation is variable and dependent on site conditions. Mitigation is discussed in detail in Section 3.2.2.4 – Impact Assessment and Mitigation Planning. RFFAs associated with oil and gas development and active mining claims have been identified in the CIAA for Segment 4. Table 3-701 summarizes the past and present development identified in the CIAA for Segment 4.

Table 3-701. Existing Cumulative Development for Wetlands in Segment 4—Brogan		
Wetlands Type	**Past and Present Actions**	**Reasonably Foreseeable Future Actions**
Forested	• Active mines (stone) • Communication Towers • Dams • Pipelines and electric transmission lines • Railroads and roads	• Oil and Gas Development • Active mines
Scrub-Shrub	• Active mines (metals, stone) • Communication Towers • Dams • Pipelines and electric transmission lines • Railroads and roads • Residential development	• Oil and Gas Development • Active mines • Vegetation Management Activities (Drill seeding, herbicide treatment)
Emergent	• Active mines (metals, stone) • Communication Towers • Huntington Wind Turbines • Dams • Pipelines and electric transmission lines • Railroads and roads • Residential development	• Oil and Gas Development • Active mines
Open Water	• Active mines (geothermal, metals, stone) • Communication Towers • Dams and flood control facilities • Pipelines and electric transmission lines • Railroads and roads • Residential development	• Oil and Gas Development • Active mines

The past and present development actions identified above in Table 3-701 include those used to quantitatively assess incremental wetland impacts in the CIAA for Segment 4 by wetland type.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 4 would contribute to and increase the cumulative impacts on intermittent and perennial streams. Table 3-700 summarizes the extent of perennial and intermittent streams in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance

Table 3-702. Cumulative Effects Summary for Wetlands in Segment 4—Brogan in Acres

Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Forested							
Applicant's Proposed Action	7,475	267	0	13	280	7,195	4.7
Variation S4-A1	*2,642*	*207*	*0*	*3*	*210*	*2,432*	*1.6*
Variation S4-A2	*2,642*	*207*	*0*	*9*	*215*	*2,427*	*4.0*
Variation S4-A3	*2,642*	*207*	*0*	*8*	*215*	*2,427*	*3.8*
Tub Mountain South	10,188	291	0	38	328	9,859	11.5
Willow Creek	5,989	250	0	15	266	5,723	5.8
Scrub-Shrub							
Applicant's Proposed Action	9,167	208	0	10	218	8,949	4.6
Variation S4-A1	*3,311*	*92*	*0*	*3*	*95*	*3,216*	*3.6*
Variation S4-A2	*3,311*	*92*	*0*	*8*	*100*	*3,211*	*8.0*
Variation S4-A3	*3,311*	*92*	*0*	*8*	*99*	*3,212*	*7.6*
Tub Mountain South	13,227	199	0	31	231	12,997	13.6
Willow Creek	7,044	115	0	12	128	6,917	9.7
Emergent							
Applicant's Proposed Action	15,646	612	0	22	634	15,012	3.5
Variation S4-A1	*2,886*	*92*	*0*	*8*	*100*	*2,785*	*8.3*
Variation S4-A2	*2,886*	*92*	*0*	*1*	*94*	*2,792*	*1.6*
Variation S4-A3	*2,886*	*92*	*0*	*1*	*93*	*2,792*	*1.3*
Tub Mountain South	19,468	1,170	0	30	1,200	18,268	2.5
Willow Creek	10,460	500	0	20	520	9,940	3.8
Open Water							
Applicant's Proposed Action	51,684	1,494	0	120	1,614	50,070	7.5
Variation S4-A1	*8,112*	*442*	*0*	*5*	*447*	*7,665*	*1.0*
Variation S4-A2	*8,112*	*442*	*0*	*7*	*450*	*7,662*	*1.7*
Variation S4-A3	*8,112*	*442*	*0*	*8*	*450*	*7,662*	*1.7*
Tub Mountain South	54,524	2,415	0	113	2,528	51,995	4.5
Willow Creek	37,466	1,184	0	123	1,307	36,159	9.4

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in incremental disturbance to forested, scrub-shrub, emergent and open water wetlands, with the greatest incremental disturbance to open water wetland types. Implementation of the Applicant's Proposed Action Alternative would contribute up to 5 percent of the estimated cumulative development on forested wetlands in the CIAA, 5 percent of the estimated cumulative development on scrub-shrub wetlands in the CIAA, 4

percent of the estimated cumulative development on emergent wetlands in the CIAA and 8 percent of the estimated cumulative develop on open water wetlands in the CIAA for Segment 4.

Of the alternatives considered in Segment 4, the Tub Mountain South Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on forested wetland types and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on forested wetland types. The Tub Mountain South Mountain Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on scrub-shrub wetland types, and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on scrub-shrub wetland types in Segment 4. The Willow Creek Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on emergent wetland types and the Tub Mountain South Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on emergent wetland types in Segment 4. The Willow Creek Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on open water wetland types and the Tub Mountain South Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on open water wetland types in Segment 4 (Table 3-701).

Past actions in the CIAA—such as oil and gas development and dryland farming, irrigated agricultural fields, mining operations and roads—have resulted in the loss or alteration of all wetland types in Segment 4. Conversion of emergent wetlands to agricultural fields has likely contributed to the largest loss of these wetland types in Segment 4 in the Willow Creek Valley and associated floodplain. These activities, along with use and maintenance of access roads in the Willow Creek Valley floodplain areas likely have contributed to permanent loss of wetlands and decrease in functional value of wetlands through impacts on water quality and vegetation management or removal as part of routine maintenance operations. Present actions also are likely to result in negative effects on existing wetlands, though it is assumed that wetland mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Restoration of degraded wetlands may provide functional lift of degraded wetlands; creation of wetlands through mitigation banking also may replace permanently lost wetlands, but only if the mitigation banks are created in the same subbasin area.

Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features, required federal and state permitting for permanent and temporary impacts on wetlands, use of wetland mitigation to offset direct loss, and the avoidance, or minimization of disturbance to wetlands is anticipated to limit cumulative effects on all wetland types in Segment 4.

Traditional Foods and Water Resources

Direct and indirect effects on water resources supporting traditional foods are anticipated to be similar to that described for Segment 1.

In addition to the past and present actions in the CIAA identified in Table 3-699 and Table 3-701 (Existing Cumulative Development for Streams / Wetlands in Segment 4 – Brogan), loss of wetlands and water resources due to construction of roads for energy or other development purposes has reduced the availability of traditional foods in the CIAA.

Habitat conversion has occurred in the central portion of Segment 4 in the Burnt River and Willow Creek valleys and surrounding floodplains through agricultural fields. Past and present actions in the CIAA are likely to have similarly reduced the availability and functionality of water resources that support traditional foods through direct loss of wetlands, surface and ground water withdrawals associated with agricultural practices and development and introduction of impervious surfaces (thereby transporting pollutants and hazardous materials overland into adjacent wetlands and waters and affecting water quality and temperature).

In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of mapped water resources in the CIAA. The extent of cumulative effects on traditional foods would relate to the cumulative effects on both water quality and temperature. Several factors would affect the total cumulative effect on water resources, including the location of traditional food, relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 5—Malheur

Streams

Permanent and temporary impacts on perennial and intermittent streams are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected streams through removal of streamside vegetation, mining activities, construction of impervious surfaces that may lead untreated stormwater directly to streams, and disturbance to soils. RFFAs were identified in the CIAA for Segment 5, generally consisting of oil and gas development, active mines and vegetation management activities associated with mitigation for the Soda wildlife. Table 3-703 summarizes the past and present development in the CIAA for Segment 5.

Table 3-703. Existing Cumulative Development for Streams in Segment 5—Malheur

Stream Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Perennial	• Active mines (stone) • Campgrounds • Communication towers • Dams and flood control facilities • Grassy Mountain Gold Mine • Railroads and roads • Residential development • Electric transmission lines	• Oil and gas development • Active mining

Table 3-703. Existing Cumulative Development for Streams in Segment 5—Malheur		
Stream Type	**Past and Present Actions**	**Reasonably Foreseeable Future Actions**
Intermittent	• Active mines (stone) • Communication towers • Extractive mining • Grassy Mountain Gold Mine • Dams • Railroads and roads • Electric transmission lines	• Oil and gas development • Active mining • Vegetation management (herbicide treatments, proposed revegetation)

The past and present development identified above includes those used to quantitatively assess incremental water quality impacts in the CIAA for Segment 5. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 5 would contribute to and increase the cumulative impacts on intermittent and perennial streams. Table 3-704 summarizes the extent of perennial and intermittent streams in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance. No temperature or sediment impaired streams are crossed by the alternative routes in Segment 5 and are not assessed in this section.

Table 3-704. Cumulative Effects Summary for Streams in Segment 5—Malheur in Acres							
Alternative Route	**Total Available Resource**	**No Action Alternative**		**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**	**Percent of Project Impact**
		Past and Present Development	**Reasonably Foreseeable Future Actions**				
Perennial Streams							
Applicant's Proposed Action	25,121	902	0	46	948	24,173	4.9
Variation S5-A1	*5,033*	*235*	*0*	*3*	*238*	*4,795*	*1.3*
Variation S5-A2	*5,033*	*235*	*0*	*3*	*238*	*4,795*	*1.3*
Variation S5-B1	*2,508*	*153*	*0*	*10*	*163*	*2,346*	*5.9*
Variation S5-B2	*2,508*	*153*	*0*	*8*	*161*	*2,347*	*4.8*
Malheur S	15,992	532	0	39	571	15,421	6.8
Malheur A	15,992	532	0	40	572	15,420	6.9
Intermittent Streams							
Applicant's Proposed Action	86,406	1,052	0	237	1,289	85,117	18.4
Variation S5-A1	*32,892*	*270*	*0*	*31*	*301*	*32,591*	*10.3*
Variation S5-A2	*32,892*	*270*	*0*	*38*	*308*	*32,584*	*12.5*
Variation S5-B1	*5,800*	*107*	*0*	*8*	*115*	*5,686*	*6.8*
Variation S5-B2	*5,800*	*107*	*0*	*4*	*111*	*5,689*	*3.7*
Malheur S	77,694	881	0	256	1,137	76,557	22.5
Malheur A	77,694	881	0	238	1,119	76,575	21.2

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in the greatest incremental disturbance to intermittent streams, and is expected to contribute up to 18 percent of the estimated impacts from cumulative development on intermittent streams. Incremental disturbance on perennial streams is anticipated to result from B2H Project implementation of the Applicant's Proposed Action Alternative, but would contribute up to 5 percent of the estimated cumulative development. Only a minimal amount of cumulative disturbance (less than 1 percent) to all perennial streams mapped in the CIAA would be anticipated.

Of the alternatives considered in Segment 5, the Malheur A Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on perennial streams, and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on perennial streams. The Malheur S Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on intermittent streams, and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on intermittent streams (refer to Table 3-704).

Past actions in the CIAA—such as dryland farming, roads and railroads and electric transmission lines—have resulted in the degradation of water quality and water quantity. Use of ground and surface waters for irrigation of agriculture areas near the Owyhee River and the Malheur River Canyon likely have contributed to the overall reduction in water availability. These activities, coupled with oil and gas development, the Grassy Mountain Gold Mine, active stone mining operations and maintenance of associated access roads, have likely have contributed to thermal degradation of waters through the introduction of overland stormwater runoff or direct discharge releases prior to passage through vegetation, where natural cooling processes could lower ambient contributory water temperatures. The likely addition of overland stormwater runoff also may affect water quality with the introduction of pollutants and other hazardous materials present in impervious surfaces adjacent to or crossing stream resources. Present actions and RFFAs such as hydroelectric projects also are likely to result in negative effects on water quality, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features and out-of-bank stream spanning, avoidance, or minimization of disturbance to water resources is anticipated to limit cumulative effects on both perennial and intermittent streams.

Wetlands

Permanent and temporary impacts on wetlands and permitting requirements are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected wetlands through direct loss of wetlands, temporary impacts on wetlands through removal or crushing of vegetation and disturbance to soils. Impacts on wetlands vary by wetland type due to rates of recovery; forested wetlands would take longer to recover than emergent wetland types. Wetland mitigation required under

federal and state permits, also may offset the total cumulative effects on wetland communities. The degree of effectiveness of mitigation is variable and dependent on site conditions. Mitigation is discussed in detail in Section 3.2.2.4 – Impact Assessment and Mitigation Planning. RFFAs associated with oil and gas development, active mining claims and vegetation management activities associated with the Soda Fire restoration efforts have been identified in the CIAA for Segment 5. Table 3-705 summarizes the past and present development identified in the CIAA for Segment 5.

Table 3-705. Existing Cumulative Development for Wetlands in Segment 5—Malheur

Wetlands Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Forested	• Active mines (stone) • Railroads and roads • Electric transmission lines	• Oil and gas development • Active mines
Scrub-Shrub	• Active mines (stone) • Communication Towers • Railroads and roads • Electric transmission lines	• Oil and gas development • Active mines
Emergent	• Active mines (stone) • Campgrounds • Communication towers • Extractive mining • Dams and flood control facilities • Railroads and roads • Electric transmission lines	• Oil and gas development • Active mines • Vegetation management (herbicide treatments)
Open Water	• Active mines (stone) • Campgrounds • Communication Towers • Extractive mining • Dams and flood control facilities • Grassy Mountain Gold Mine • Pipelines and electric transmission lines • Railroads and roads • Residential development	• Oil and gas development • Active mines

The past, present and RFFAs identified in Table 3-705 include those used to quantitatively assess incremental wetland impacts in the CIAA for Segment 5 by wetland type. Potential effects of the Soda wildfire on wetlands would depend on intensity of the fire and the amount of time since the occurrence of the event, precipitation amounts in the subbasin the wetland is located, surrounding upland vegetation cover type and maturity, and degree of associated degradation to vegetation due to impacts from fire. Vegetation communities in the subbasin that have been severely affected by fire may contain individual plants completely consumed by fire and areas charred so severely that the local seed bank is depleted, thereby creating a longer recovery period. Areas less affected by fire may contain individual plants partially affected, and they may recover in the same growing season. Scrub-shrub wetlands severely affected by fire may be replaced by a different community type, and, thus, wetland function would be affected during the recovery period.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 5 would contribute to and increase the cumulative impacts on all wetland types. Table 3-706 summarizes the extent of wetland types in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-706. Cumulative Effects Summary for Wetlands in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Forested							
Applicant's Proposed Action	10,880	175	0	21	196	10,684	10.6
Variation S5-A1	*1,885*	*41*	*0*	*1*	*42*	*1,843*	*1.8*
Variation S5-A2	*1,885*	*41*	*0*	*1*	*42*	*1,844*	*1.4*
Variation S5-B1	*1,360*	*38*	*0*	*4*	*42*	*1,318*	*10.1*
Variation S5-B2	*1,360*	*38*	*0*	*3*	*41*	*1,319*	*7.0*
Malheur S	4,712	21	0	10	30	4,682	31.9
Malheur A	4,712	21	0	12	32	4,680	36.2
Scrub-Shrub							
Applicant's Proposed Action	15,637	370	0	22	392	15,245	5.7
Variation S5-A1	*2,568*	*73*	*0*	*1*	*74*	*2,494*	*1.0*
Variation S5-A2	*2,568*	*73*	*0*	*1*	*74*	*2,494*	*0.8*
Variation S5-B1	*2,219*	*78*	*0*	*6*	*83*	*2,136*	*6.7*
Variation S5-B2	*2,219*	*78*	*0*	*11*	*89*	*2,130*	*12.6*
Malheur S	7,482	183	0	14	196	7,286	7.0
Malheur A	7,482	183	0	12	194	7,288	6.0
Emergent							
Applicant's Proposed Action	35,376	1,721	0	36	1,757	33,619	2.1
Variation S5-A1	*6,749*	*306*	*0*	*6*	*312*	*6,437*	*2.0*
Variation S5-A2	*6,749*	*306*	*0*	*1*	*307*	*6,443*	*0.2*
Variation S5-B1	*2,455*	*92*	*0*	*5*	*96*	*2,359*	*4.9*
Variation S5-B2	*2,455*	*92*	*0*	*10*	*102*	*2,353*	*10.0*
Malheur S	20,217	664	0	17	681	19,536	2.5
Malheur A	20,217	664	0	19	683	19,534	2.8
Open Water							
Applicant's Proposed Action	53,673	2,084	0	85	2,169	51,503	3.9
Variation S5-A1	*14,972*	*392*	*0*	*18*	*411*	*14,561*	*4.5*
Variation S5-A2	*14,972*	*392*	*0*	*17*	*409*	*14,563*	*4.1*
Variation S5-B1	*4,542*	*266*	*0*	*14*	*280*	*4,263*	*4.9*
Variation S5-B2	*4,542*	*266*	*0*	*14*	*280*	*4,262*	*5.1*

Table 3-706. Cumulative Effects Summary for Wetlands in Segment 5—Malheur in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Malheur S	37,643	966	0	119	1,085	36,558	11.0
Malheur A	37,643	966	0	113	1,080	36,564	10.5
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

B2H Project implementation of the Applicant's Proposed Action Alternative would result in incremental disturbance to forested, scrub-shrub, emergent and open water wetlands, with the greatest incremental disturbance to forested wetland types. Implementation of the Applicant's Proposed Action Alternative would contribute up to 11 percent of the estimated cumulative development on forested wetlands in the CIAA, 6 percent of the estimated cumulative development on scrub-shrub wetlands in the CIAA, 2 percent of the estimated cumulative development on emergent wetlands in the CIAA and 4 percent of the estimated cumulative develop on open water wetlands in the CIAA for Segment 5.

Of the alternatives considered in Segment 5, the Malheur A Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on forested wetland types and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on forested wetland types. The Malheur S Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on scrub-shrub wetland types, and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on scrub-shrub wetland types in Segment 5. The Malheur A Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on emergent wetland types and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on emergent wetland types in Segment 5. The Malheur S Alternative would contribute the greatest amount of incremental disturbance relative to estimated cumulative development on open water wetland types and the Applicant's Proposed Action Alternative would contribute the least amount of incremental disturbance relative to estimated cumulative development on open water wetland types in Segment 5 (Table 3-706).

Past actions in the CIAA—such as oil and gas development and dryland farming, irrigated agricultural fields, the Grassy Mountain Gold Mine and stone mining operations and roads—have resulted in the loss or alteration of all types of wetlands in Segment 5. Conversion of emergent wetlands to agricultural fields has likely contributed to the largest loss of these wetland types in Segment 5 near the Owyhee River and associated floodplain. These activities, along with use and maintenance of access roads throughout Segment 5 likely have contributed to permanent loss of wetlands and decrease in functional

value of wetlands through impacts on water quality and vegetation management or removal as part of routine maintenance operations. Present actions also are likely to result in negative effects on existing wetlands, though it is assumed that wetland mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Restoration of degraded wetlands may provide functional lift of degraded wetlands; creation of wetlands through mitigation banking also may replace permanently lost wetlands, but only if the mitigation banks are created in the same subbasin area.

Similarly, the application of several B2H Project design features and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features, required federal and state permitting for permanent and temporary impacts on wetlands, use of wetland mitigation to offset direct loss, and the avoidance, or minimization of disturbance to wetlands is anticipated to limit cumulative effects on all wetland types in Segment 5.

Traditional Foods and Water Resources

Direct and indirect effects on water resources supporting traditional foods are anticipated to be similar to that described for Segment 1.

In addition to the past and present actions in the CIAA identified in Table 3-703 and Table 3-705 (Existing Cumulative Development for Streams / Wetlands in Segment 5 – Malheur), loss of wetlands and water resource due to construction of roads for energy or other development purposes and conversion of existing wetlands to agricultural lands has reduced the water quality that all other traditional foods rely on in the CIAA.

Much of the habitat conversion has occurred in the northern third of Segment 5 in the area of the Malheur and Owyhee River crossings. Several mines and oil and gas developments are scattered throughout Segment 5, however no concentration of these types of developments exists. Past and present actions in the CIAA are likely to have similarly reduced the availability and functionality of water resources that support traditional foods through direct loss of wetlands, surface and ground water withdrawals associated with agricultural practices and development and introduction of impervious surfaces (thereby transporting pollutants and hazardous materials overland into adjacent wetlands and waters and affecting water quality and temperature).

In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of mapped water resources in the CIAA. The extent of cumulative effects on traditional foods would relate to the cumulative effects on both water quality and temperature. Several factors would affect the total cumulative effect on water resources, including the location of traditional food, relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 6—Treasure Valley

Streams

Permanent and temporary impacts on perennial and intermittent streams are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected streams through removal of streamside vegetation, construction of impervious surfaces that may lead untreated stormwater directly to streams, and disturbance to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on streams, though it is assumed these RFFAs would take similar steps to avoid, minimize, and mitigate potential impacts on water quality of streams. Table 3-707 summarizes the past and present actions and other RFFAs identified in the CIAA for Segment 6.

Table 3-707. Existing Cumulative Development for Streams in Segment 6—Treasure Valley

Wetlands Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Forested	• Residential development • Roads • Electric transmission lines	• No RFFAs proposed to affect forested wetlands in Segment 6
Scrub-Shrub	• Active mines (sand and gravel) • Residential development • Roads • Electric transmission lines • FlatTop United mine • Reynolds Creek Outlet Weir	• Vegetation management (drill seeding, herbicide treatments)
Emergent	• Communication towers • Extractive mining • Dams • Railroads and roads • Electric transmission lines • Gateway West transmission line proposed route	• Active mines • Vegetation management (drill seeding, herbicide treatments)
Open Water	• Active mines (stone) • Active mines (sand and gravel) • Dams • Residential development • Roads • Reynolds Creek Outlet Weir • Electric transmission lines	• Active mines • Vegetation management (herbicide treatments, proposed revegetation)

The past and present actions and other RFFAs identified above include those activities used to quantitatively assess incremental impacts on water quality in the CIAA for Segment 6.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 6 would contribute to and increase the cumulative impacts on intermittent and perennial streams Table 3-708 summarizes the extent of perennial and intermittent streams in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-708. Cumulative Effects Summary for Streams in Segment 6—Treasure Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Perennial Streams							
Applicant's Proposed Action	12,625	235	0	36	271	12,354	13.3
Variation S6-A1	*5,739*	*81*	*0*	*16*	*97*	*5,642*	*16.4*
Variation S6-A2	*5,739*	*81*	*0*	*21*	*102*	*5,637*	*20.7*
Variation S6-B1	*6,412*	*113*	*0*	*12*	*125*	*6,288*	*9.5*
Variation S6-B2	*6,412*	*113*	*0*	*14*	*127*	*6,285*	*11.0*
Intermittent Streams							
Applicant's Proposed Action	34,137	797	0	142	939	33,198	15.1
Variation S6-A1	*16,829*	*390*	*0*	*64*	*454*	*16,375*	*14.0*
Variation S6-A2	*16,829*	*390*	*0*	*59*	*448*	*16,380*	*13.0*
Variation S6-B1	*18,100*	*470*	*0*	*68*	*538*	*17,561*	*12.6*
Variation S6-B2	*18,100*	*470*	*0*	*76*	*546*	*17,554*	*13.9*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in the greatest incremental disturbance to intermittent streams, and is expected to contribute up to 15 percent of the estimated impacts from cumulative development on intermittent streams. Incremental disturbance on perennial streams is anticipated to result from B2H Project implementation of the Applicant's Proposed Action Alternative, but would contribute up to 13 percent of the estimated cumulative development. Only a minimal amount of cumulative disturbance (about 2 percent) of all perennial streams mapped in the CIAA would be anticipated.

Past actions in the CIAA—such as dryland farming, roads and railroads and electric transmission lines—have resulted in the degradation of water quality and water quantity. Use of ground and surface waters for irrigation of agriculture areas likely have contributed to the overall reduction in water availability. These activities, coupled with oil and gas development, active stone mining operations and maintenance of associated access roads, have likely have contributed to thermal degradation of waters through the introduction of overland stormwater runoff or direct discharge releases prior to passage through vegetation, where natural cooling processes could lower ambient contributory water temperatures. The likely addition of overland stormwater runoff also may affect water quality with the introduction of pollutants and other hazardous materials present in impervious surfaces adjacent to or crossing stream resources. Present actions also are likely to result in negative effects on water quality, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Similarly, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys,

implementation of soil erosion and sediment control features and out-of-bank stream spanning, avoidance, or minimization of disturbance to water resources is anticipated to limit cumulative effects on both perennial and intermittent streams.

Wetlands

Permanent and temporary impacts on wetlands and permitting requirements are anticipated to be similar to that described for Segment 1.

Several past and present actions in the CIAA are likely to have similarly affected wetlands through direct loss of wetland types, temporary impacts on wetlands through removal or crushing of vegetation and disturbance to soils. Impacts on wetlands vary by wetland type due to rates of recovery; forested wetlands would take longer to recover than emergent wetland types. Construction of several RFFAs in the CIAA, including oil and gas development, active mining operations and associated access roads, would result in similar cumulative effects on wetlands, though it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on wetlands. Wetland mitigation required under federal and state permits, also may offset the total cumulative effects on wetland communities. The degree of effectiveness of mitigation is variable and dependent on site conditions. Mitigation is discussed in detail in Section 3.2.2.4 – Impact Assessment and Mitigation Planning. Table 3-709 summarizes the past and present actions and other RFFAs identified in the CIAA for Segment 6.

Table 3-709. Existing Cumulative Development for Wetlands in Segment 6—Treasure Valley

Wetlands Type	Past and Present Actions	Reasonably Foreseeable Future Actions
Forested	• Residential development • Roads • Electric transmission lines	• No RFFAs proposed to affect forested wetlands in Segment 6
Scrub-Shrub	• Active mines (sand and gravel) • Residential development • Roads • Electric transmission lines • FlatTop United mine • Reynolds Creek Outlet Weir	• Vegetation management (drill seeding, herbicide treatments)
Emergent	• Communication towers • Extractive mining • Dams • Railroads and roads • Electric transmission lines • Gateway West transmission line proposed route	• Active mines • Vegetation management (drill seeding, herbicide treatments)
Open Water	• Active mines (stone) • Active mines (sand and gravel) • Dams • Residential development • Roads • Reynolds Creek Outlet Weir • Electric transmission lines	• Active mines • Vegetation management (herbicide treatments, proposed revegetation)

The past, present and RFFAs identified in Table 3-709 include those used to quantitatively assess incremental wetland impacts in the CIAA for Segment 6 by wetland type. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 6 would contribute to and increase the cumulative impacts on all wetland types. Table 3-710 summarizes the extent of wetland types in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Potential effects of the Soda wildfire on wetlands would depend on intensity of the fire and the amount of time since the occurrence of the event; precipitation amounts in the subbasin the wetland is located, surrounding upland vegetation cover type and maturity, and degree of associated degradation to vegetation due to impacts from fire. Vegetation communities in the subbasin that have been severely affected by fire may contain individual plants completely consumed by fire and areas charred so severely that the local seed bank is depleted, thereby creating a longer recovery period. Areas less affected by fire may contain individual plants partially affected, and they may recover in the same growing season. Scrub-shrub wetlands severely affected by fire may be replaced by a different community type, and, thus, wetland function would be affected during the recovery period.

Table 3-710. Cumulative Effects Summary for Wetlands in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Forested							
Applicant's Proposed Action	6,879	18	0	26	44	6,835	59.1
Variation S6-A1	*3,821*	*17*	*0*	*12*	*30*	*3,791*	*41.7*
Variation S6-A2	*3,821*	*17*	*0*	*19*	*36*	*3,785*	*51.9*
Variation S6-B1	*3,254*	*5*	*0*	*10*	*16*	*3,238*	*65.3*
Variation S6-B2	*3,254*	*5*	*0*	*12*	*17*	*3,237*	*68.2*
Scrub-Shrub							
Applicant's Proposed Action	8,947	48	0	28	76	8,871	36.6
Variation S6-A1	*4,060*	*9*	*0*	*15*	*24*	*4,036*	*62.7*
Variation S6-A2	*4,060*	*9*	*0*	*19*	*28*	*4,032*	*67.3*
Variation S6-B1	*4,281*	*19*	*0*	*9*	*28*	*4,253*	*33.2*
Variation S6-B2	*4,281*	*19*	*0*	*9*	*27*	*4,254*	*31.3*
Emergent							
Applicant's Proposed Action	11,434	197	0	33	231	11,203	14.3
Variation S6-A1	*7,217*	*128*	*0*	*20*	*148*	*7,069*	*13.6*
Variation S6-A2	*7,217*	*128*	*0*	*26*	*153*	*7,064*	*16.6*
Variation S6-B1	*4,543*	*75*	*0*	*10*	*85*	*4,458*	*11.3*
Variation S6-B2	*4,543*	*75*	*0*	*10*	*85*	*4,457*	*12.1*

Table 3-710. Cumulative Effects Summary for Wetlands in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Open Water							
Applicant's Proposed Action	16,613	385	0	66	451	16,163	14.7
Variation S6-A1	*9,529*	*191*	*0*	*36*	*227*	*9,302*	*15.9*
Variation S6-A2	*9,529*	*191*	*0*	*29*	*219*	*9,309*	*13.1*
Variation S6-B1	*8,205*	*181*	*0*	*14*	*195*	*8,010*	*7.2*
Variation S6-B2	*8,205*	*181*	*0*	*15*	*196*	*8,009*	*7.6*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

B2H Project implementation of the Applicant's Proposed Action Alternative would result in incremental disturbance to forested, scrub-shrub, emergent and open water wetlands, with the greatest incremental disturbance to open water wetland types. Implementation of the Applicant's Proposed Action Alternative would contribute up to 60 percent of the estimated cumulative development on forested wetlands in the CIAA, 37 percent of the estimated cumulative development on scrub-shrub wetlands in the CIAA, 14 percent of the estimated cumulative development on emergent wetlands in the CIAA and 15 percent of the estimated cumulative develop on open water wetlands in the CIAA for Segment 6 (refer to Table 3-710).

Past actions in the CIAA—such as oil and gas development and dryland farming, irrigated agricultural fields, stone mining operations and roads—have resulted in the loss or alteration of all types of wetlands in Segment 6. Conversion of emergent wetlands to agricultural fields has likely contributed to the largest loss of these wetland types in Segment 6. These activities, along with use and maintenance of access roads throughout Segment 6, likely have contributed to permanent loss of wetlands and decrease in functional value of wetlands through impacts on water quality and vegetation management or removal as part of routine maintenance operations. Present actions also are likely to result in negative effects on existing wetlands, though it is assumed that wetland mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Restoration of degraded wetlands may provide functional lift of degraded wetlands; creation of wetlands through mitigation banking also may replace permanently lost wetlands, but only if the mitigation banks are created in the same subbasin area.

Similarly, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys, implementation of soil erosion and sediment control features, required federal and state permitting for permanent and temporary impacts

on wetlands, use of wetland mitigation to offset direct loss, and the avoidance, or minimization of disturbance to wetlands is anticipated to limit cumulative effects on all wetland types in Segment 6.

Traditional Foods and Water Resources

Direct and indirect effects on water resources supporting traditional foods are anticipated to be similar to that described for Segment 1.

In addition to the past and present actions in the CIAA identified in Table 3-707 and Table 3-709 (Existing Cumulative Development for Streams / Wetlands in Segment 6 – Treasure Valley), loss of wetlands and water resource due to construction of roads for energy or other development purposes has reduced the availability of traditional foods in the CIAA.

Habitat conversion has occurred in the foothills of the Owyhee Mountains and in areas south of Elephant Butte. Several mines and oil and gas developments are scattered throughout Segment 6, however no concentration of these types of developments exists. Past and present actions in the CIAA are likely to have similarly reduced the availability and functionality of water resources that support traditional foods through direct loss of wetlands, surface and ground water withdrawals associated with agricultural practices and development and introduction of impervious surfaces (thereby transporting pollutants and hazardous materials overland into adjacent wetlands and waters and affecting water quality and temperature).

In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of mapped water resources in the CIAA. The extent of cumulative effects on traditional foods would relate to the cumulative effects on both water quality and temperature. Several factors would affect the total cumulative effect on water resources, including the location of traditional food, relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

3.3.3.3 VEGETATION

This section estimates cumulative effects on vegetation from B2H Project effects in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.3.5.

ISSUES IDENTIFIED FOR ANALYSIS

During public scoping and ongoing agency review, several issues relating to vegetation resources were identified for analysis, including loss of native vegetation communities, disturbance to special status plant species and supporting habitats, introduction and spread of noxious weeds, and decreased availability of traditional foods and ethnobotanical resources. Issues related to fire regimes and effects on vegetation communities also were identified during public scoping and agency review. Cumulative effects on vegetation resources due to wildfires and vegetation management are discussed qualitatively, as vegetation communities can recover from these events. Recovery from wildfires depends on the extent and severity of the fire; amount of time since the fire, precipitation amounts, vegetation community type, and degree of wildfire effects, including weed invasion, soil loss, and

alteration of community structure. The quantitative analysis did not consider conversion of native vegetation communities to agricultural or developed lands due to the difficulty of determining preexisting vegetation conditions and the low possibility of converted lands returning to native vegetation communities.

Cumulative effects on federally listed and candidate plant species, sensitive plant species, increased potential for establishment and spread of noxious weeds, and traditional and ethnobotanical resources are analyzed and discussed qualitatively, while cumulative effects on native vegetation communities are analyzed and discussed quantitatively.

The vegetation communities included in the quantitative cumulative effects analysis are those dominated by native vegetation where disturbance is anticipated to result in moderate residual impacts as identified in Section 3.2.3.6. These vegetation communities are the Aspen, Desert Shrub, Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mixed Conifer Forest, Mountain Shrub, Native Grasslands, RCAs, and Tall Sagebrush Steppe vegetation community subtypes. Cumulative impacts on other native vegetation communities like bare ground, cliffs, and talus, forest-other, or open water also are expected wherever B2H Project disturbance occurs in areas not affected, or likely to be affected, by existing development or RFFAs. The cumulative effects on water resources, including open water, are discussed in Section 3.3.4.2.

Existing Condition

Conversion of native vegetation to agricultural use since settlement of European peoples in the area in the middle of the nineteenth century has significantly affected the character of landscapes and the quantity and quality of vegetation resources in portions of the CIAA. Construction of settlements, transportation systems, and human population growth also has resulted in further conversion of vegetation resources of the area. Drought, wildfire, livestock grazing, introduction of highly competitive, non-native species, and climate change have likewise resulted in changes in vegetation resources in more recent times. Incremental modification of the landscape by more recent projects and actions has occurred in this area, further contributing to its departure from presettlement ecological conditions.

Results by Segment

Segment 1—Morrow-Umatilla

Vegetation Communities

Permanent loss of vegetation would occur with the construction of B2H Project features such as roads, tower pads, and buildings or maintenance of the 250-foot wide right-of-way. Temporary removal or crushing of vegetation in work areas or temporary access roads would result in disturbance to native vegetation communities, which increases the risk of weed establishment and spread. The types of potential direct and indirect effects are described in greater detail in Section 3.2.3.6.

Several past and present actions in the CIAA—such as residential development, mining operations, energy development, pipelines, transmission lines, and transportation development—are likely to have similarly affected native vegetation communities through removal of native vegetation, alteration to

vegetation community structure, and introduction and spread of noxious weeds. Construction of several RFFAs in the CIAA would result in similar cumulative effects on native vegetation communities, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts on vegetation communities. Table 3-711 summarizes the past and present actions and other RFFAs identified in the CIAA for Segment 1.

Table 3-711. Existing Cumulative Development for Vegetation Communities Segment 1—Morrow-Umatilla

Vegetation Community	Past and Present Actions	Reasonably Foreseeable Future Actions
Aspen	• Residential Structures • Pipelines • Roads • Transmission Lines	None identified
Desert Shrub	• Aggregate/Mineral Mining • Residential and other structures • Pipeline • Northwest Corp, Oregon Wind, Umatilla Electric Cooperative (UEC) and other transmission lines • Oregon Wind Energy Development • Railroads • Roads	• Buttercreek Wind Turbines • Wheatridge Wind Turbines
Dwarf Sagebrush Steppe	• Aggregate/Mineral Mining • Residential and Communication Structures • Roads • Transmission Line	• Wheatridge Wind Farm Utility • Wheatridge Wind Turbines
Mixed Conifer Forest	• Aggregate/Mineral Mining • Residential, Communication, and other structures • Pipelines • Railroad • Roads • Transmission Lines	None identified
Mountain Shrub	• Railroad • Residential Structures • Roads • Transmission Lines	None identified
Native Grasslands	• Aggregate/Mineral Mining • Residential and Communications Structures • Cascade Natural Gas, Perennial Wind Chaser, Northwest Corp and Other Pipelines • CBE, Northwest Corp, and other Transmission Lines • Oregon Wind and Service Buttes Wind Energy Development • Railroads • Roads	• Buttercreek Wind Turbines • Wheatridge Wind Farm Utility • Wheatridge Wind Turbines

Table 3-711. Existing Cumulative Development for Vegetation Communities Segment 1—Morrow-Umatilla		
Vegetation Community	**Past and Present Actions**	**Reasonably Foreseeable Future Actions**
Riparian Conservation Area	• Aggregate/Mineral Mining • Residential and Other Structures • Cascade Natural Gas, Northwest Corp, Perennial Wind Chaser, and Other Pipelines • CBE, Northwest Corp, Oregon Wind, Perennial Wind Chaser, UEC, and Other Transmission Lines • Madison Farms Solar Development • Railroads • Roads	• Buttercreek Wind Turbines • Wallula to McNary 230-kV PacifiCorp Transmission Line • Wheatridge Wind Farm Utility
Tall Sagebrush Steppe	• Aggregate/Mineral Mining • Residential, Communication, and Other Structures • Cascade Natural Gas, Northwest Corp, Perennial Wind Chaser, and Other Pipelines • CBE, Northwest Corp, Oregon Wind, Perennial Wind Chaser, UEC, Service Butte, and other Transmission Lines • Madison Farms Solar Development • Oregon Wind and Service Buttes Wind Energy Development • Railroads • Roads	• Buttercreek Wind Turbines • Mariah Wind Turbines • Wallula to McNary 230-kV PacifiCorp Transmission Line • Wheatridge Wind Farm Utility • Wheatridge Wind Turbines

In addition to the 2015 Boardman fire, numerous other fires that ranged in extent from 600 to 18,000 acres on the NWSTF Boardman have occurred since 1998 affecting large portions of the NWSTF Boardman (Navy 2012). These fires primarily affected Tall Sagebrush Steppe vegetation communities, which can take decades to recover from wildfire. Besides the native vegetation communities on the NWSTF Boardman, none of the native vegetation communities analyzed in Segment 1 were affected by the large wildfires that burned during the 2015 fire season.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 1 would contribute to and increase the cumulative impacts on several native vegetation communities (refer to Table 3-712). Vegetation communities cumulatively affected include Aspen, Desert Shrub, Dwarf Sage Steppe, Mixed Conifer Forest, Mountain Shrub, Native Grasslands, RCAs, and Tall Sagebrush Steppe. Juniper and Mahogany Woodland vegetation communities are not crossed by the Applicant's Proposed Action Alternative or any other alternative route, and cumulative effects on this vegetation community are not expected. B2H Project implementation would contribute to the cumulative effects on native vegetation communities in Segment 1 to varying degrees. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. Table 3-712 summarizes the extent of the vegetation community in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental

disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-712. Cumulative Effects Summary for Vegetation in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Aspen							
Applicant's Proposed Action	485	5	0	7	12	473	56.3
Variation S1-B1	*82*	*1*	*0*	*0*	*1*	*81*	*None*
Variation S1-B2	*82*	*1*	*0*	*0*	*1*	*81*	*None*
East of Bombing Range Road	485	5	0	7	12	473	56.2
Applicant's Proposed Action – Southern Route	514	6	0	7	13	501	53.7
West of Bombing Range Road – Southern Route	528	6	0	7	13	515	54.4
Longhorn	485	5	0	7	12	473	56.8
Interstate 84	485	5	0	7	12	473	56.7
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	514	6	0	7	13	501	53.9
Desert Shrub							
Applicant's Proposed Action	1,777	37	4	4	45	1,733	8.4
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
East of Bombing Range Road	1,777	37	4	11	52	1,725	21.5
Applicant's Proposed Action – Southern Route	1,772	37	4	4	45	1,727	8.5
West of Bombing Range Road – Southern Route	1,655	36	3	3	42	1,613	6.3
Longhorn	995	25	4	6	35	960	17.7
Interstate 84	1,573	38	8	0	47	1,526	0.9
Variation S1-A1	*493*	*5*	*0*	*0*	*6*	*487*	*6.9*
Variation S1-A2	*541*	*6*	*0*	*2*	*8*	*533*	*19.7*

Table 3-712. Cumulative Effects Summary for Vegetation in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84 – Southern Route	1,567	38	8	0	47	1,520	0.9
Dwarf Sagebrush Steppe							
Applicant's Proposed Action	3,350	15	1	5	21	3,329	22.8
Variation S1-B1	*86*	*1*	*0*	*0*	*2*	*84*	*23.8*
Variation S1-B2	*86*	*1*	*0*	*0*	*1*	*85*	*None*
East of Bombing Range Road	3,350	15	1	5	21	3,329	22.8
Applicant's Proposed Action – Southern Route	6,463	30	1	20	51	6,412	39.5
West of Bombing Range Road – Southern Route	7,609	43	14	21	78	7,531	27.4
Longhorn	3,323	15	0	5	20	3,303	24.4
Interstate 84	2,244	14	0	4	18	2,226	22.9
Variation S1-A1	*472*	*5*	*0*	*0*	*5*	*466*	*7.4*
Variation S1-A2	*508*	*5*	*0*	*2*	*7*	*501*	*29.1*
Interstate 84 – Southern Route	5,357	29	0	20	48	5,309	40.5
Mixed Conifer Forest							
Applicant's Proposed Action	58,100	636	0	262	898	57,202	29.2
Variation S1-B1	*23,241*	*292*	*0*	*116*	*408*	*22,833*	*28.4*
Variation S1-B2	*23,241*	*292*	*0*	*99*	*391*	*22,851*	*25.3*
East of Bombing Range Road	58,100	636	0	262	898	57,202	29.1
Applicant's Proposed Action – Southern Route	76,335	894	0	289	1,183	75,152	24.5
West of Bombing Range Road – Southern Route	82,340	985	0	303	1,288	81,052	23.5
Longhorn	58,100	636	0	267	903	57,197	29.6
Interstate 84	58,100	636	0	266	902	57,198	29.5
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	76,335	894	0	292	1,186	75,149	24.6

Table 3-712. Cumulative Effects Summary for Vegetation in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Mountain Shrub							
Applicant's Proposed Action	1,663	5	0	5	10	1,653	53.0
Variation S1-B1	*52*	*2*	*0*	*0*	*2*	*50*	*None*
Variation S1-B2	*52*	*2*	*0*	*0*	*2*	*50*	*None*
East of Bombing Range Road	1,663	5	0	5	10	1,653	53.0
Applicant's Proposed Action – Southern Route	1,973	7	0	9	15	1,958	56.2
West of Bombing Range Road – Southern Route	2,080	8	0	9	17	2,063	53.1
Longhorn	1,663	5	0	5	10	1,653	53.5
Interstate 84	1,663	5	0	5	10	1,653	53.4
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	1,973	7	0	9	15	1,958	56.5
Native Grasslands							
Applicant's Proposed Action	37,779	256	5	157	418	37,361	37.5
Variation S1-B1	*1,650*	*37*	*0*	*3*	*41*	*1,609*	*8.1*
Variation S1-B2	*1,650*	*37*	*0*	*3*	*40*	*1,610*	*6.9*
East of Bombing Range Road	37,779	256	5	153	415	37,364	37.0
Applicant's Proposed Action – Southern Route	58,200	336	5	234	576	57,624	40.6
West of Bombing Range Road – Southern Route	90,252	462	316	312	1,090	89,161	28.6
Longhorn	37,665	278	4	162	444	37,221	36.5
Interstate 84	30,674	284	2	146	432	30,242	33.8
Variation S1-A1	*4,096*	*35*	*0*	*5*	*40*	*4,056*	*13.0*
Variation S1-A2	*3,951*	*32*	*0*	*2*	*34*	*3,917*	*5.2*
Interstate 84 – Southern Route	51,095	365	2	224	591	50,504	38.0

Table 3-712. Cumulative Effects Summary for Vegetation in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Riparian Conservation Area							
Applicant's Proposed Action	48,798	2,353	1	97	2,451	46,347	4.0
Variation S1-B1	*8,178*	*250*	*0*	*13*	*263*	*7,915*	*4.8*
Variation S1-B2	*8,178*	*250*	*0*	*23*	*273*	*7,905*	*8.4*
East of Bombing Range Road	48,798	2,353	1	100	2,453	46,345	4.1
Applicant's Proposed Action – Southern Route	56,792	2,467	1	120	2,588	54,204	4.6
West of Bombing Range Road – Southern Route	65,414	2,892	434	141	3,468	61,947	4.1
Longhorn	52,296	2,670	1	111	2,783	49,514	4.0
Interstate 84	61,771	4,189	8	159	4,356	57,415	3.7
Variation S1-A1	*8,873*	*730*	*0*	*18*	*747*	*8,126*	*2.4*
Variation S1-A2	*8,451*	*670*	*0*	*16*	*686*	*7,765*	*2.3*
Interstate 84 – Southern Route	69,765	4,303	8	181	4,492	65,273	4.0
Tall Sagebrush Steppe							
Applicant's Proposed Action	136,661	1,770	71	364	2,206	134,455	16.5
Variation S1-B1	*1,476*	*28*	*0*	*6*	*35*	*1,441*	*18.4*
Variation S1-B2	*1,476*	*28*	*0*	*5*	*34*	*1,442*	*15.2*
East of Bombing Range Road	136,661	1,770	71	447	2,289	134,372	19.5
Applicant's Proposed Action – Southern Route	149,234	1,822	71	446	2,340	146,894	19.1
West of Bombing Range Road – Southern Route	174,958	1,824	1,182	491	3,497	171,461	14.1
Longhorn	142,685	2,470	67	431	2,968	139,718	14.5
Interstate 84	121,507	2,871	21	268	3,160	118,347	8.5
Variation S1-A1	*40,444*	*537*	*0*	*38*	*575*	*39,869*	*6.7*
Variation S1-A2	*47,086*	*566*	*0*	*222*	*788*	*46,298*	*28.2*
Interstate 84 – Southern Route	134,080	2,922	21	349	3,293	130,788	10.6

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

B2H Project implementation would result in the greatest incremental disturbance to Tall Sagebrush Steppe vegetation communities for all alternative routes and is expected to contribute up to 20 percent

of the estimated cumulative development. Incremental disturbance to Native Grasslands and Mixed Conifer Forests is anticipated to result from B2H Project implementation to similar, but lesser extents. Incremental disturbance to RCAs is anticipated, but would only contribute up to 10 percent of the estimated cumulative development and result in minimal disturbance (less than 1 percent) relative the total extent of RCA vegetation communities identified in the CIAA. Of the alternatives considered in Segment 1, the Applicant's Proposed Action – Southern Route would contribute the greatest amount of incremental disturbance relative to estimated cumulative development, and Variation S1-B2 would contribute approximately twice as much as Variation S1-B1 to the estimated cumulative development. B2H Project implementation is anticipated to contribute largely (greater than 50 percent) to the estimated cumulative development in Aspen and Mountain Shrub vegetation communities. However, the anticipated extent of incremental disturbance to both these communities would be less than 10 acres (refer to Table 3-712).

Federally Listed and Candidate Plant Species

Federally listed or candidate plant species are not known to occur in the CIAA of Applicant's Proposed Action Alternative or any other alternative route analyzed in Segment 1. As such, cumulative effects on these resources are not anticipated as a result of B2H Project implementation.

Other Sensitive Plant Species

Direct loss of sensitive plant habitat or individuals could result from ground-disturbing activities or construction of permanent or temporary features for the Proposed Action and all other alternative routes considered in Segment 1. Indirect negative impacts on habitat (i.e., habitat degradation) also could occur adjacent to disturbance through changes to erosional patterns, dust deposition increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Past actions in the CIAA—such as residential development, mining operations, energy development, pipelines, and agricultural development—have resulted in the loss or degradation of sensitive plant species habitat. Historic grazing practices, other soil-disturbing activities, and transport of non-native plant materials, likely have contributed to the prevalence of invasive weeds and associated effects on sensitive plant species habitats. Present actions also are likely to result in loss or degradation of sensitive plant species habitat, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Inadvertent habitat degradation in areas adjacent to ground-disturbing actions also is likely to occur with present actions.

Without detailed engineering, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on sensitive plant species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in sensitive species habitat is anticipated to limit cumulative effects on sensitive plant species.

RFFAs like the proposed Wheatridge and Buttercreek wind turbines that require the construction of long-term or permanent structures or that introduce non-native plant species also would be likely to result in changes to vegetation community structure and the degradation of potential habitat for special status plants.

Implementation of the B2H Project could contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. However, given the extent of existing disturbance to sensitive plant species habitats and B2H Project commitment to mitigation measures limiting impacts on sensitive plant resources, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Noxious Weeds

The removal of vegetation, disturbance of soils, and transportation of plant materials increase the likelihood of noxious weed invasion and spread. Past actions that required the removal of vegetation and disturbance of soil likely resulted in the introduction of some noxious weeds in the CIAA. Present actions that require the removal of vegetation and disturbance of soils also may contribute to the establishment and spread of noxious weeds. Continuing maintenance of these projects is assumed to involve some degree of noxious weed surveying, treatment, and monitoring, which would reduce the potential for noxious weed invasion due to these actions.

Implementation of the B2H Project would require the removal of vegetation and the disturbance of soils, which would increase the susceptibility of the B2H Project area to noxious weed invasion. A noxious weed management plan would be prepared for the B2H Project detailing preconstruction weed surveys, control methods and thresholds, and post-construction monitoring requirements. Other design features of the B2H Project for environmental protection aim to limit noxious weed introduction and spread by limiting disturbance extent and requiring reclamation of disturbed areas with desirable native vegetation. Implementation of this plan and other design features of the B2H Project for environmental protection would minimize the spread and introduction of noxious weeds, though some degree of weed invasion and spread is still likely due to large areas of ground disturbance and increased vehicle use that would accompany B2H Project implementation.

Many RFFAs in the CIAA are likely to require the removal of vegetation and the disturbance of soils, further increasing the risk of noxious weed establishment and spread in the CIAA. However, RFFAs also are assumed to implement practices to prevent, treat, and monitor noxious weed invasions, thereby minimizing the invasion of noxious weeds due to these projects or activities. Given the extent of existing disturbance, prevalence of noxious weeds, and commitment of the B2H Project and other RFFAs to limiting the establishment and spread of noxious weeds, implementation of the B2H Project is anticipated to minimally contribute to the cumulative effects of noxious weeds on vegetation resources in the CIAA.

Traditional Foods and Ethnobotanical Resources

Direct loss of vegetation communities providing traditional foods or ethnobotanical resources could result from ground-disturbing activities or construction of permanent or temporary features for the

Proposed Action and all other alternative routes considered in Segment 1. Indirect effects reducing the availability and abundance of these resources could occur adjacent to disturbance through dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

In addition to the past and present actions in the CIAA identified in Table 3-711, conversion of native vegetation communities for agricultural or other development purposes has drastically reduced the availability of traditional foods and ethnobotanical resources in the CIAA. Much of the habitat conversion has occurred in the western portion of Segment 1 in the area surrounding Pendleton, with native vegetation communities supporting traditional foods and ethnobotanical resources mostly occurring south and east of Pilot Rock. Past and present actions in the CIAA are likely to have similarly reduced the availability and abundance of traditional foods and ethnobotanical resources through removal of native vegetation, alteration to vegetation community composition, and establishment and spread of invasive weeds. Several RFFAs are identified in the CIAA for Segment 1; however, all are located west of Pendleton in areas largely converted for agricultural purposes and are unlikely to contribute to cumulative effects on traditional foods or ethnobotanical resources.

B2H Project implementation would contribute to the cumulative effects on native vegetation communities supporting traditional foods or ethnobotanical resources to varying degrees. The extent of cumulative effects on these vegetation communities is summarized in Table 3-712 and explained in greater detail in the analysis of cumulative effects on vegetation communities. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. The extent of cumulative effects on traditional foods and ethnobotanical resources would relate to the cumulative effects on native vegetation communities, but depend on several factors, including the location of traditional food and ethnobotanical resources relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 2—Blue Mountains

Vegetation Communities

Permanent loss of vegetation would occur with the construction of B2H Project features such as roads, tower pads, and buildings or maintenance of the 250-foot wide right-of-way. Temporary removal or crushing of vegetation in work areas or temporary access roads would result in disturbance to native vegetation communities, which increases the risk of weed establishment and spread. The types of potential direct and indirect effects are described in greater detail in Section 3.2.3.6.

Several past and present actions in the CIAA—such as residential development, mining operations, energy development, pipelines, transmission lines, and transportation development—are likely to have similarly affected native vegetation communities through removal of native vegetation, alteration to vegetation community structure, and introduction and spread of noxious weeds. No RFFAs were identified in the CIAA for Segment 2. Table 3-713 summarizes the past and present development in the

CIAA for Segment 2. The past and present actions identified below include those used to quantitatively assess incremental loss of native vegetation communities in the CIAA for Segment 2.

Table 3-713. Cumulative Development Activities for Vegetation Communities Segment 2—Blue Mountains

Vegetation Community	Past and Present Activities
Aspen	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential and Other Structures • Transmission Lines
Dwarf Sagebrush Steppe	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines • Elkhorn Wind Turbines
Juniper and Mahogany Woodland	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Communications and Other Structures • Transmission Lines • Elkhorn Wind Turbines
Mixed Conifer Forest	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines • Elkhorn Wind Turbines
Mountain Shrub	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Line • Elkhorn Wind Turbines
Native Grasslands	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Line • Elkhorn Wind Turbines

Table 3-713. Cumulative Development Activities for Vegetation Communities Segment 2—Blue Mountains	
Vegetation Community	**Past and Present Activities**
Riparian Conservation Area	• Aggregate/Mineral Mining • Dams • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines • Elkhorn Wind Turbines
Tall Sagebrush Steppe	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines • Elkhorn Wind Turbines

None of the native vegetation communities analyzed in Segment 2 were affected by the large wildfires that burned during the 2015 fire season or other known historic wildfires. The 2005 Spring Creek fire burned approximately 1,000 acres of Mixed Conifer Forest and Mountain Shrub vegetation communities southeast of the Applicant's Proposed Action Alternative and all other alternatives, but does not occur in the CIAA for the alternative routes considered in Segment 2.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 2 would contribute to and increase the cumulative impacts on several native vegetation communities (refer to Table 3-714). Vegetation communities cumulatively affected include Aspen, Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mixed Conifer Forest, Mountain Shrub, Native Grasslands, RCAs, and Tall Sagebrush Steppe. Desert Shrub vegetation communities are not crossed by the Applicant's Proposed Action Alternative or any other alternative route in Segment 2, and cumulative effects on this vegetation community are not expected. B2H Project implementation would contribute to the cumulative effects on native vegetation communities in Segment 2 to varying degrees. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. Table 3-714 summarizes the extent of the vegetation community in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-714. Cumulative Effects Summary for Vegetation in Segment 2—Blue Mountains in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Aspen							
Applicant's Proposed Action	601	6	0	5	10	591	44.2
Variation S2-A1	*220*	*1*	*0*	*0*	*1*	*219*	*None*
Variation S2-A2	*220*	*1*	*0*	*0*	*1*	*219*	*None*
Variation S2-B1	*205*	*2*	*0*	*0*	*2*	*203*	*23.2*
Variation S2-B2	*205*	*2*	*0*	*0*	*2*	*204*	*None*
Variation S2-C1	*101*	*2*	*0*	*0*	*2*	*99*	*None*
Variation S2-C2	*163*	*7*	*0*	*0*	*7*	*156*	*None*
Variation S2-E1	*44*	*1*	*0*	*0*	*1*	*42*	*None*
Variation S2-E2	*44*	*1*	*0*	*0*	*1*	*42*	*None*
Variation S2-F1	*280*	*3*	*0*	*4*	*6*	*273*	*60.2*
Variation S2-F2	*280*	*3*	*0*	*0*	*3*	*277*	*None*
Glass Hill	601	6	0	4	10	592	41.3
Variation S2-D1	*59*	*1*	*0*	*0*	*1*	*59*	*None*
Variation S2-D2	*59*	*1*	*0*	*0*	*1*	*59*	*None*
Mill Creek	721	14	0	2	15	705	10.5
Dwarf Sagebrush Steppe							
Applicant's Proposed Action	1,355	13	0	5	18	1,337	25.6
Variation S2-A1	*157*	*3*	*0*	*0*	*3*	*154*	*None*
Variation S2-A2	*157*	*3*	*0*	*0*	*3*	*154*	*None*
Variation S2-B1	*155*	*2*	*0*	*0*	*2*	*153*	*None*
Variation S2-B2	*155*	*2*	*0*	*0*	*3*	*152*	*15.3*
Variation S2-C1	*136*	*1*	*0*	*3*	*4*	*132*	*69.7*
Variation S2-C2	*152*	*2*	*0*	*4*	*6*	*146*	*67.6*
Variation S2-E1	*261*	*2*	*0*	*0*	*3*	*258*	*8.6*
Variation S2-E2	*261*	*2*	*0*	*0*	*2*	*259*	*None*
Variation S2-F1	*1,062*	*9*	*0*	*2*	*11*	*1,052*	*16.2*
Variation S2-F2	*1,062*	*9*	*0*	*3*	*12*	*1,050*	*26.9*
Glass Hill	1,355	13	0	4	18	1,337	25.3
Variation S2-D1	*64*	*1*	*0*	*0*	*1*	*64*	*None*
Variation S2-D2	*64*	*1*	*0*	*1*	*1*	*63*	*53.3*
Mill Creek	1,419	17	0	4	21	1,398	19.0

Table 3-714. Cumulative Effects Summary for Vegetation in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Juniper and Mahogany Woodland							
Applicant's Proposed Action	4,430	45	0	28	73	4,357	38.0
Variation S2-A1	*1,013*	*6*	*0*	*0*	*6*	*1,007*	*None*
Variation S2-A2	*1,013*	*6*	*0*	*0*	*6*	*1,007*	*None*
Variation S2-B1	*1,923*	*15*	*0*	*1*	*16*	*1,907*	*8.5*
Variation S2-B2	*1,923*	*15*	*0*	*1*	*16*	*1,907*	*5.7*
Variation S2-C1	*1,314*	*14*	*0*	*23*	*37*	*1,278*	*62.3*
Variation S2-C2	*1,521*	*22*	*0*	*17*	*39*	*1,482*	*43.6*
Variation S2-E1	*1,371*	*18*	*0*	*2*	*21*	*1,350*	*11.9*
Variation S2-E2	*1,371*	*18*	*0*	*7*	*25*	*1,346*	*26.0*
Variation S2-F1	*2,103*	*25*	*0*	*1*	*26*	*2,077*	*2.5*
Variation S2-F2	*2,103*	*25*	*0*	*4*	*29*	*2,074*	*12.8*
Glass Hill	4,430	45	0	29	74	4,356	39.2
Variation S2-D1	*942*	*9*	*0*	*21*	*30*	*912*	*70.9*
Variation S2-D2	*942*	*9*	*0*	*0*	*9*	*933*	*None*
Mill Creek	5,161	74	0	25	98	5,063	25.1
Mixed Conifer Forest							
Applicant's Proposed Action	54,882	514	0	222	736	54,146	30.2
Variation S2-A1	16,902	111	0	26	137	16,765	18.8
Variation S2-A2	16,902	111	0	30	142	16,760	21.4
Variation S2-B1	24,505	204	0	30	235	24,271	12.9
Variation S2-B2	24,505	204	0	27	231	24,274	11.7
Variation S2-C1	26,831	283	0	114	397	26,434	28.6
Variation S2-C2	30,957	363	0	97	461	30,496	21.2
Variation S2-E1	11,771	149	0	27	176	11,595	15.3
Variation S2-E2	11,771	149	0	17	166	11,605	10.5
Variation S2-F1	11,150	120	0	3	123	11,026	2.8
Variation S2-F2	11,150	120	0	1	121	11,029	0.9
Glass Hill	54,882	514	0	196	710	54,172	27.6
Variation S2-D1	*18,573*	*180*	*0*	*59*	*239*	*18,335*	*24.6*
Variation S2-D2	*18,573*	*180*	*0*	*57*	*237*	*18,336*	*24.1*
Mill Creek	60,190	618	0	166	784	59,405	21.2

Table 3-714. Cumulative Effects Summary for Vegetation in Segment 2—Blue Mountains in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Mountain Shrub							
Applicant's Proposed Action	19,272	245	0	157	402	18,870	39.1
Variation S2-A1	*2,833*	*28*	*0*	*5*	*33*	*2,801*	*14.6*
Variation S2-A2	*2,833*	*28*	*0*	*4*	*32*	*2,802*	*11.2*
Variation S2-B1	*4,491*	*50*	*0*	*31*	*80*	*4,411*	*38.1*
Variation S2-B2	*4,491*	*50*	*0*	*15*	*65*	*4,426*	*23.3*
Variation S2-C1	*2,001*	*25*	*0*	*1*	*26*	*1,975*	*5.4*
Variation S2-C2	*3,579*	*74*	*0*	*3*	*77*	*3,503*	*3.9*
Variation S2-E1	*2,087*	*42*	*0*	*10*	*53*	*2,034*	*19.4*
Variation S2-E2	*2,087*	*42*	*0*	*10*	*52*	*2,035*	*18.6*
Variation S2-F1	*14,438*	*192*	*0*	*82*	*274*	*14,164*	*30.0*
Variation S2-F2	*14,438*	*192*	*0*	*57*	*249*	*14,189*	*22.8*
Glass Hill	19,272	245	0	176	421	18,851	41.9
Variation S2-D1	*1,700*	*22*	*0*	*2*	*24*	*1,676*	*9.5*
Variation S2-D2	*1,700*	*22*	*0*	*1*	*23*	*1,677*	*4.2*
Mill Creek	22,923	341	0	152	493	22,430	30.9
Native Grasslands							
Applicant's Proposed Action	3,806	44	0	37	81	3,725	45.3
Variation S2-A1	*1,508*	*22*	*0*	*19*	*41*	*1,467*	*45.8*
Variation S2-A2	*1,508*	*22*	*0*	*15*	*37*	*1,472*	*39.7*
Variation S2-B1	*1,071*	*13*	*0*	*0*	*13*	*1,057*	*None*
Variation S2-B2	*1,071*	*13*	*0*	*0*	*14*	*1,057*	*1.6*
Variation S2-C1	*599*	*7*	*0*	*0*	*7*	*592*	*None*
Variation S2-C2	*1,155*	*19*	*0*	*1*	*19*	*1,135*	*4.5*
Variation S2-E1	*156*	*2*	*0*	*0*	*2*	*154*	*12.6*
Variation S2-E2	*156*	*2*	*0*	*0*	*2*	*154*	*None*
Variation S2-F1	*1,699*	*15*	*0*	*14*	*29*	*1,670*	*47.6*
Variation S2-F2	*1,699*	*15*	*0*	*11*	*26*	*1,673*	*41.3*
Glass Hill	3,806	44	0	36	80	3,726	44.9
Variation S2-D1	*538*	*6*	*0*	*0*	*6*	*532*	*None*
Variation S2-D2	*538*	*6*	*0*	*15*	*21*	*517*	*69.8*
Mill Creek	5,802	82	0	41	122	5,680	33.4

Table 3-714. Cumulative Effects Summary for Vegetation in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Riparian Conservation Area							
Applicant's Proposed Action	32,528	1,118	0	96	1,214	31,314	7.9
Variation S2-A1	*8,772*	*315*	*0*	*5*	*320*	*8,452*	*1.5*
Variation S2-A2	*8,772*	*315*	*0*	*8*	*323*	*8,449*	*2.4*
Variation S2-B1	*11,729*	*394*	*0*	*20*	*414*	*11,315*	*4.8*
Variation S2-B2	*11,729*	*394*	*0*	*26*	*420*	*11,309*	*6.2*
Variation S2-C1	*9,964*	*223*	*0*	*10*	*232*	*9,732*	*4.2*
Variation S2-C2	*13,336*	*783*	*0*	*15*	*798*	*12,538*	*1.9*
Variation S2-E1	*4,674*	*279*	*0*	*5*	*284*	*4,389*	*1.8*
Variation S2-E2	*4,674*	*279*	*0*	*5*	*284*	*4,390*	*1.7*
Variation S2-F1	*13,791*	*580*	*0*	*41*	*621*	*13,170*	*6.6*
Variation S2-F2	*13,791*	*580*	*0*	*35*	*615*	*13,177*	*5.6*
Glass Hill	32,528	1,118	0	104	1,222	31,306	8.5
Variation S2-D1	*6,596*	*133*	*0*	*17*	*151*	*6,445*	*11.6*
Variation S2-D2	*6,596*	*133*	*0*	*18*	*152*	*6,444*	*12.2*
Mill Creek	39,835	2,215	0	92	2,307	37,528	4.0
Tall Sagebrush Steppe							
Applicant's Proposed Action	41,949	534	0	187	721	41,228	26.0
Variation S2-A1	*2,306*	*14*	*0*	*4*	*18*	*2,288*	*19.8*
Variation S2-A2	*2,306*	*14*	*0*	*2*	*16*	*2,290*	*11.6*
Variation S2-B1	*5,015*	*69*	*0*	*1*	*69*	*4,946*	*1.0*
Variation S2-B2	*5,015*	*69*	*0*	*14*	*82*	*4,933*	*16.7*
Variation S2-C1	*4,027*	*64*	*0*	*69*	*133*	*3,894*	*52.2*
Variation S2-C2	*5,200*	*86*	*0*	*46*	*132*	*5,068*	*34.9*
Variation S2-E1	*3,696*	*47*	*0*	*6*	*53*	*3,643*	*10.7*
Variation S2-E2	*3,696*	*47*	*0*	*19*	*67*	*3,630*	*29.0*
Variation S2-F1	*35,616*	*456*	*0*	*97*	*553*	*35,063*	*17.5*
Variation S2-F2	*35,616*	*456*	*0*	*148*	*604*	*35,012*	*24.6*
Glass Hill	41,949	534	0	168	701	41,247	23.9
Variation S2-D1	*3,609*	*61*	*0*	*10*	*71*	*3,537*	*13.8*
Variation S2-D2	*3,609*	*61*	*0*	*5*	*66*	*3,543*	*6.9*
Mill Creek	45,771	604	0	264	868	44,903	30.4

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

B2H Project implementation would result in the greatest incremental disturbance to Mixed Conifer Forest vegetation communities for both the Applicant's Proposed Action Alternative and the Glass Hill Alternative, and is expected to contribute up to 30 percent of the estimated cumulative development. Incremental disturbance to Mountain Shrub and Tall Sagebrush Steppe is anticipated to result with both these alternatives to similar, but lesser extents. The Mill Creek Alternative would result in greater incremental disturbance to Tall Sagebrush Steppe vegetation communities than either the Applicant's Proposed Action Alternative or the Glass Hill Alternative and lesser incremental disturbance to Mixed Conifer Forest and Mountain Shrub vegetation communities. Both these vegetation communities have been affected by past or present development to a greater extent along the Mill Creek Alternative, and the resulting incremental disturbance relative estimated cumulative disturbance would less for the Mill Creek Alternative than the Applicant's Proposed Action Alternative or the Glass Hill Alternative. The Mill Creek Alternative would contribute less to the estimated cumulative development in Native Grasslands than the Applicant's Proposed Action Alternative or the Glass Hill Alternative for similar reasons. Incremental disturbance to RCA vegetation communities are anticipated for all alternatives, but would only contribute up to 8 percent of the estimated cumulative development and result in minimal disturbance (less than 1 percent) relative the total extent of RCA vegetation communities identified in the CIAA. B2H Project implementation is anticipated to contribute to the estimated cumulative development in Aspen vegetation communities, but the anticipated extent of incremental disturbance would be less than 10 acres (refer to Table 3-714).

Federally Listed and Candidate Plant Species

The federally listed plant, Howell's spectacular thelypody, is known to occur in the CIAA at the southern end of Segment 2. The impacts of B2H Project implementation on Howell's spectacular thelypody are anticipated to be minimal as the nearest known occurrence is approximately 1.5 miles from the centerline of any alternative route considered in Segment 2. Even if individuals are found during preconstruction surveys, direct loss of habitat or individuals is not anticipated to result from B2H Project-related disturbance as application of Selective Mitigation Measures 8 and 13 requiring avoidance and minimizing disturbance are expected to limit impacts on Howell's spectacular thelypody. Indirect negative impacts on habitat (i.e., habitat degradation) could occur adjacent to disturbance through changes to erosional patterns, dust deposition increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Past actions in the CIAA—in particular the historic urban and agricultural development in the Baker-Powder River Valley—have resulted in loss and degradation of Howell's spectacular thelypody habitat. Historic grazing practices, other soil-disturbing activities, and transport of non-native plant materials, likely have contributed to the prevalence of invasive weeds and associated effects on this species. Present actions occurring in Howell's spectacular thelypody habitat also are likely to result in loss or degradation of habitat, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Inadvertent habitat degradation in areas adjacent to ground-disturbing actions also is likely to occur with present actions.

Without detailed engineering and preconstruction surveys, the exact location of Howell's spectacular thelypody in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on this species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in Howell's spectacular thelypody habitat is anticipated to limit cumulative effects on this species. Additional measures developed through the Section 7 consultation process would further limit cumulative effects.

Implementation of the B2H Project could contribute incrementally the loss of Howell's spectacular thelypody habitat that has occurred or could occur in the CIAA. However, given the distance of known occurrences from any action alternative and B2H Project commitment to mitigation measures limiting impacts on federally listed or candidate plant species, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Other Sensitive Plant Species

B2H Project implementation could result in the types of potential effects on sensitive plant species and habitats similar to that expected for Segment 1. Past and present actions in the CIAA- such as residential development, mining operations, energy development, agricultural development, and transportation development- have resulted in the loss or degradation of sensitive plant species habitat similar to that described for Segment 1.

Without detailed engineering, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on sensitive plant species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in sensitive species habitat is anticipated to limit cumulative effects on sensitive plant species.

Implementation of the B2H Project could contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. However, given the extent of existing disturbance to sensitive plant species habitats and B2H Project commitment to mitigation measures limiting impacts on sensitive plant resources, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Noxious Weeds

B2H Project implementation would result in the types of disturbance likely to increase the potential for noxious weed establishment and spread similar to that expected in Segment 1. Past and present actions in the CIAA- such as residential development, mining operations, energy development, agricultural development, and transportation development- also are likely to have contributed to the prevalence and distribution of noxious weeds in the CIAA, although present actions are assumed to implement practices to prevent, treat, and monitor noxious weed invasions. The creation of a noxious weed management plan and implementation of other design features of the B2H Project for

environmental protection to limit the spread and introduction of noxious weeds would be similar to that described for Segment 1.

Given the extent of existing disturbance, prevalence of noxious weeds, and commitment of the B2H Project and other RFFAs to limiting the establishment and spread of noxious weeds, implementation of the B2H Project is anticipated to minimally contribute to the cumulative effects of noxious weeds on vegetation resources in the CIAA.

Traditional Foods and Ethnobotanical Resources

Direct loss of vegetation communities providing traditional foods or ethnobotanical resources could result from ground-disturbing activities or construction of permanent or temporary features for the Proposed Action and all other alternative routes considered in Segment 2. Indirect effects reducing the availability and abundance of these resources could occur adjacent to disturbance through dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Conversion of native vegetation communities for agricultural or other development purposes has occurred in the CIAA, primarily in the Grande Ronde, Baker, and Powder River valleys, at the southern end of Segment 2. Several other past and present actions in the CIAA identified in Table 3-713 also have resulted in reduced availability of traditional foods and ethnobotanical resources in the CIAA. Large extents of native vegetation communities, primarily Mixed Conifer Forest and Mountain Shrub, supporting traditional foods and ethnobotanical resources exist in the Blue Mountains in the northern and central portion of the CIAA.

B2H Project implementation would contribute to the cumulative effects on native vegetation communities supporting traditional foods or ethnobotanical resources to varying degrees. The extent of cumulative effects on these vegetation communities is summarized in Table 3-714 and explained in greater detail in the analysis of cumulative effects on vegetation communities. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. The extent of cumulative effects on traditional foods and ethnobotanical resources would relate to the cumulative effects on native vegetation communities, but depend on several factors, including the location of traditional food and ethnobotanical resources relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 3—Baker Valley

Vegetation Communities

Permanent loss of vegetation would occur with the construction of B2H Project features such as roads, tower pads, and buildings or maintenance of the 250-foot wide right-of-way. Temporary removal or crushing of vegetation in work areas or temporary access roads would result in disturbance to native vegetation communities, which increases the risk of weed establishment and spread. The types of potential direct and indirect effects are described in greater detail in Section 3.2.3.6.

Several past and present actions in the CIAA—such as residential development, mining operations, energy development, pipelines, transmission lines, and transportation development—are likely to have similarly affected native vegetation communities through removal of native vegetation, alteration to vegetation community structure, and introduction and spread of noxious weeds. Several active mining claims were identified as RFFAs throughout the CIAA, but were not included in the quantitative assessment as the incremental loss of native vegetation communities associated with developing these claims could not be determined. Table 3-715 summarizes the past and present development in the CIAA for Segment 3. The past and present actions identified below include those used to quantitatively assess incremental loss of native vegetation communities in the CIAA for Segment 3.

Table 3-715. Cumulative Development Activities for Vegetation Communities Segment 3—Baker Valley

Vegetation Community	Past and Present Activities
Aspen	• Aggregate/Mineral Mining • Pipelines • Roads • Communication Structures
Dwarf Sagebrush Steppe	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Communication and Other Structures • Transmission Lines
Juniper and Mahogany Woodland	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Structures • Transmission Lines
Mixed Conifer Forest	• Aggregate/Mineral Mining • Pipelines • Roads • Residential, Communication, and Other Structures • Transmission Lines
Mountain Shrub	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines
Native Grasslands	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines

Table 3-715. Cumulative Development Activities for Vegetation Communities Segment 3—Baker Valley	
Vegetation Community	**Past and Present Activities**
Riparian Conservation Area	• Aggregate/Mineral Mining • Dams • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Line
Tall Sagebrush Steppe	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Line • Elkhorn Wind Turbines

Several large wildfires burned in the CIAA for Segment 3 in 2015 and have affected all types of native vegetation communities. These fires include the Cornet-Windy Ridge, Eagle Complex, Dry Gulch and Lime Hill Fire. The Lime Hill Fire affected vegetation in the CIAA for all alternative routes, the Cornet-Windy Ridge affected vegetation in the CIAA for alternative routes except the Timber Canyon Alternative, and the Eagle Complex and Dry Gulch fires only affected vegetation in the CIAA for the Timber Canyon Alternative. Although these fires affected all vegetation community types, the greatest extent of effects were to the dominant vegetation community in the CIAA- Tall Sagebrush Steppe. Tall Sagebrush Steppe communities can take decades to recover from fire disturbance and may transition into a community more typical of a Non-native Grassland if invasion by annual grasses and long-term alterations to the fire regime occur (Miller et al. 2013).

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 3 would contribute to and increase the cumulative impacts on several native vegetation communities (refer to Table 3-716). Vegetation communities cumulatively affected include Aspen, Dwarf Sagebrush Steppe, Juniper and Mahogany Woodland, Mixed Conifer Forest, Mountain Shrub, Native Grasslands, RCAs, and Tall Sagebrush Steppe. Desert Shrub vegetation communities are not crossed by the Applicant's Proposed Action Alternative or any other alternative route in Segment 3, and cumulative effects on this vegetation community are not expected. B2H Project implementation would contribute to the cumulative effects on native vegetation communities in Segment 3 to varying degrees. Table 3-716 summarizes the extent of the vegetation community in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-716. Cumulative Effects Summary for Vegetation in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Aspen							
Applicant's Proposed Action	3,750	19	0	0	19	3,731	None
Variation S3-A1	*86*	*1*	*0*	*0*	*1*	*85*	*None*
Variation S3-A2	*125*	*3*	*0*	*0*	*3*	*122*	*None*
Variation S3-B1	*703*	*7*	*0*	*0*	*7*	*695*	*None*
Variation S3-B2	*759*	*8*	*0*	*0*	*8*	*751*	*None*
Variation S3-B3	*759*	*8*	*0*	*0*	*8*	*751*	*None*
Variation S3-B4	*759*	*8*	*0*	*0*	*8*	*751*	*None*
Variation S3-B5	*759*	*8*	*0*	*0*	*8*	*751*	*None*
Variation S3-C1	*2,613*	*9*	*0*	*0*	*9*	*2,604*	*None*
Variation S3-C2	*2,613*	*9*	*0*	*0*	*9*	*2,604*	*None*
Variation S3-C3	*2,277*	*7*	*0*	*0*	*7*	*2,270*	*None*
Variation S3-C4	*2,277*	*7*	*0*	*0*	*7*	*2,270*	*None*
Variation S3-C5	*2,277*	*7*	*0*	*2*	*9*	*2,267*	*26.5*
Variation S3-C6	*2,229*	*12*	*0*	*19*	*31*	*2,199*	*60.5*
Flagstaff A	3,807	20	0	0	20	3,787	None
Timber Canyon	4,819	34	0	11	45	4,774	24.5
Flagstaff A – Burnt River Mountain	3,470	18	0	0	18	3,452	None
Flagstaff B	3,807	20	0	0	20	3,787	None
Flagstaff B – Burnt River West	3,508	19	0	2	21	3,487	10.9
Flagstaff B – Durkee	3,423	23	0	16	39	3,384	40.9
Dwarf Sagebrush Steppe							
Applicant's Proposed Action	15,659	147	0	44	191	15,468	22.9
Variation S3-A1	*1,204*	*7*	*0*	*2*	*9*	*1,194*	*22.0*
Variation S3-A2	*1,260*	*8*	*0*	*1*	*8*	*1,251*	*7.3*
Variation S3-B1	*4,992*	*51*	*0*	*32*	*83*	*4,909*	*38.2*
Variation S3-B2	*3,623*	*38*	*0*	*8*	*46*	*3,577*	*17.3*
Variation S3-B3	*3,623*	*38*	*0*	*12*	*50*	*3,573*	*24.6*
Variation S3-B4	*3,623*	*38*	*0*	*12*	*50*	*3,573*	*24.4*
Variation S3-B5	*3,623*	*38*	*0*	*8*	*45*	*3,578*	*17.1*
Variation S3-C1	*9,046*	*68*	*0*	*10*	*78*	*8,968*	*13.2*
Variation S3-C2	*9,046*	*68*	*0*	*8*	*76*	*8,970*	*10.9*
Variation S3-C3	*7,664*	*59*	*0*	*31*	*90*	*7,574*	*34.8*
Variation S3-C4	*7,664*	*59*	*0*	*30*	*88*	*7,576*	*33.6*

Table 3-716. Cumulative Effects Summary for Vegetation in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C5	*7,664*	*59*	*0*	*28*	*87*	*7,577*	*32.5*
Variation S3-C6	*6,803*	*41*	*0*	*16*	*56*	*6,746*	*27.5*
Flagstaff A	14,290	133	0	20	153	14,137	12.9
Timber Canyon	18,275	86	0	87	173	18,101	50.3
Flagstaff A – Burnt River Mountain	12,908	124	0	39	163	12,744	24.0
Flagstaff B	14,290	133	0	25	158	14,132	15.6
Flagstaff B – Burnt River West	12,963	125	0	38	163	12,800	23.6
Flagstaff B – Durkee	12,047	106	0	29	136	11,911	21.6
Juniper and Mahogany Woodland							
Applicant's Proposed Action	7,390	58	0	4	62	7,328	5.8
Variation S3-A1	*775*	*4*	*0*	*1*	*5*	*770*	*13.0*
Variation S3-A2	*830*	*4*	*0*	*0*	*4*	*826*	*None*
Variation S3-B1	*2,162*	*16*	*0*	*2*	*18*	*2,143*	*13.5*
Variation S3-B2	*2,132*	*17*	*0*	*8*	*25*	*2,107*	*30.5*
Variation S3-B3	*2,132*	*17*	*0*	*6*	*24*	*2,109*	*26.1*
Variation S3-B4	*2,132*	*17*	*0*	*6*	*24*	*2,109*	*25.8*
Variation S3-B5	*2,132*	*17*	*0*	*8*	*25*	*2,108*	*30.2*
Variation S3-C1	*3,517*	*27*	*0*	*0*	*28*	*3,489*	*1.7*
Variation S3-C2	*3,517*	*27*	*0*	*0*	*27*	*3,490*	*None*
Variation S3-C3	*3,751*	*28*	*0*	*24*	*52*	*3,699*	*45.7*
Variation S3-C4	*3,751*	*28*	*0*	*22*	*50*	*3,701*	*44.2*
Variation S3-C5	*3,751*	*28*	*0*	*12*	*40*	*3,711*	*30.5*
Variation S3-C6	*4,208*	*25*	*0*	*19*	*44*	*4,164*	*44.0*
Flagstaff A	7,360	60	0	9	68	7,292	12.7
Timber Canyon	4,602	16	0	20	36	4,566	55.5
Flagstaff A – Burnt River Mountain	7,595	61	0	30	91	7,504	33.3
Flagstaff B	7,360	60	0	7	67	7,293	10.9
Flagstaff B – Burnt River West	7,650	61	0	17	78	7,572	22.2
Flagstaff B – Durkee	8,051	57	0	24	82	7,970	29.8

Table 3-716. Cumulative Effects Summary for Vegetation in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Mixed Conifer Forest							
Applicant's Proposed Action	11,957	70	0	1	71	11,886	0.9
Variation S3-A1	*139*	*1*	*0*	*0*	*1*	*138*	*None*
Variation S3-A2	*1,235*	*12*	*0*	*0*	*12*	*1,224*	*None*
Variation S3-B1	*4,453*	*33*	*0*	*0*	*33*	*4,420*	*None*
Variation S3-B2	*4,448*	*33*	*0*	*0*	*33*	*4,415*	*None*
Variation S3-B3	*4,448*	*33*	*0*	*0*	*33*	*4,415*	*None*
Variation S3-B4	*4,448*	*33*	*0*	*0*	*33*	*4,415*	*None*
Variation S3-B5	*4,448*	*33*	*0*	*0*	*33*	*4,415*	*None*
Variation S3-C1	*5,784*	*26*	*0*	*1*	*27*	*5,757*	*2.6*
Variation S3-C2	*5,784*	*26*	*0*	*1*	*27*	*5,757*	*2.6*
Variation S3-C3	*5,167*	*23*	*0*	*0*	*23*	*5,144*	*None*
Variation S3-C4	*5,167*	*23*	*0*	*0*	*23*	*5,144*	*None*
Variation S3-C5	*5,167*	*23*	*0*	*22*	*45*	*5,122*	*49.1*
Variation S3-C6	*7,850*	*50*	*0*	*41*	*91*	*7,759*	*45.3*
Flagstaff A	11,952	70	0	1	71	11,881	0.9
Timber Canyon	71,589	582	0	443	1,025	70,564	43.2
Flagstaff A – Burnt River Mountain	11,335	67	0	0	67	11,269	None
Flagstaff B	11,952	70	0	1	71	11,881	0.9
Flagstaff B – Burnt River West	12,432	78	0	19	97	12,335	19.6
Flagstaff B – Durkee	14,018	93	0	35	129	13,889	27.4
Mountain Shrub							
Applicant's Proposed Action	10,289	136	0	11	147	10,143	7.5
Variation S3-A1	*3,803*	*47*	*0*	*6*	*53*	*3,750*	*11.8*
Variation S3-A2	*7,630*	*71*	*0*	*3*	*74*	*7,556*	*4.5*
Variation S3-B1	*1,039*	*34*	*0*	*0*	*34*	*1,004*	*None*
Variation S3-B2	*1,021*	*37*	*0*	*8*	*45*	*976*	*17.5*
Variation S3-B3	*1,021*	*37*	*0*	*8*	*45*	*976*	*17.1*
Variation S3-B4	*1,021*	*37*	*0*	*2*	*39*	*982*	*4.3*
Variation S3-B5	*1,021*	*37*	*0*	*5*	*42*	*979*	*12.2*
Variation S3-C1	*5,276*	*63*	*0*	*4*	*67*	*5,209*	*6.0*
Variation S3-C2	*5,276*	*63*	*0*	*4*	*67*	*5,209*	*5.6*
Variation S3-C3	*5,738*	*66*	*0*	*26*	*91*	*5,646*	*28.0*
Variation S3-C4	*5,738*	*66*	*0*	*32*	*98*	*5,640*	*32.7*

Table 3-716. Cumulative Effects Summary for Vegetation in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C5	*5,738*	*66*	*0*	*40*	*106*	*5,632*	*37.8*
Variation S3-C6	*5,495*	*31*	*0*	*42*	*73*	*5,423*	*57.6*
Flagstaff A	10,272	138	0	16	155	10,117	10.5
Timber Canyon	20,820	174	0	102	276	20,543	37.0
Flagstaff A – Burnt River Mountain	10,733	141	0	36	177	10,556	20.5
Flagstaff B	10,272	138	0	19	158	10,114	12.1
Flagstaff B – Burnt River West	14,560	165	0	47	212	14,348	22.2
Flagstaff B – Durkee	10,491	106	0	52	158	10,333	33.0
Native Grasslands							
Applicant's Proposed Action	11,447	88	0	60	148	11,299	40.7
Variation S3-A1	*1,936*	*14*	*0*	*12*	*26*	*1,910*	*45.9*
Variation S3-A2	*2,256*	*15*	*0*	*6*	*21*	*2,235*	*29.9*
Variation S3-B1	*1,624*	*15*	*0*	*16*	*31*	*1,593*	*52.2*
Variation S3-B2	*1,030*	*9*	*0*	*3*	*12*	*1,018*	*22.6*
Variation S3-B3	*1,030*	*9*	*0*	*1*	*10*	*1,019*	*12.4*
Variation S3-B4	*1,030*	*9*	*0*	*1*	*10*	*1,020*	*10.5*
Variation S3-B5	*1,030*	*9*	*0*	*3*	*12*	*1,017*	*27.8*
Variation S3-C1	*7,800*	*50*	*0*	*32*	*81*	*7,718*	*38.9*
Variation S3-C2	*7,800*	*50*	*0*	*21*	*71*	*7,729*	*29.7*
Variation S3-C3	*6,787*	*49*	*0*	*28*	*77*	*6,710*	*35.9*
Variation S3-C4	*6,787*	*49*	*0*	*32*	*81*	*6,706*	*39.3*
Variation S3-C5	*6,787*	*49*	*0*	*45*	*94*	*6,693*	*47.7*
Variation S3-C6	*6,308*	*26*	*0*	*54*	*79*	*6,229*	*67.9*
Flagstaff A	10,852	82	0	47	129	10,723	36.4
Timber Canyon	16,524	86	0	47	133	16,391	35.6
Flagstaff A – Burnt River Mountain	9,839	81	0	43	124	9,715	34.6
Flagstaff B	10,852	82	0	44	126	10,726	35.2
Flagstaff B – Burnt River West	10,159	82	0	48	131	10,029	36.9
Flagstaff B – Durkee	9,360	58	0	63	120	9,240	52.1

Table 3-716. Cumulative Effects Summary for Vegetation in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Riparian Conservation Area							
Applicant's Proposed Action	51,782	2,339	0	119	2,458	49,324	4.9
Variation S3-A1	*13,667*	*682*	*0*	*28*	*710*	*12,957*	*4.0*
Variation S3-A2	*16,767*	*724*	*0*	*19*	*743*	*16,024*	*2.6*
Variation S3-B1	*17,372*	*605*	*0*	*18*	*622*	*16,749*	*2.8*
Variation S3-B2	*20,341*	*882*	*0*	*32*	*914*	*19,427*	*3.5*
Variation S3-B3	*20,341*	*882*	*0*	*32*	*914*	*19,427*	*3.5*
Variation S3-B4	*20,341*	*882*	*0*	*34*	*916*	*19,425*	*3.7*
Variation S3-B5	*20,341*	*882*	*0*	*37*	*919*	*19,422*	*4.0*
Variation S3-C1	*23,682*	*1,087*	*0*	*48*	*1,136*	*22,546*	*4.3*
Variation S3-C2	*23,682*	*1,087*	*0*	*50*	*1,138*	*22,544*	*4.4*
Variation S3-C3	*18,164*	*1,011*	*0*	*70*	*1,081*	*17,083*	*6.5*
Variation S3-C4	*18,164*	*1,011*	*0*	*44*	*1,055*	*17,110*	*4.1*
Variation S3-C5	*18,164*	*1,011*	*0*	*66*	*1,077*	*17,087*	*6.1*
Variation S3-C6	*17,430*	*474*	*0*	*109*	*582*	*16,848*	*18.6*
Flagstaff A	54,751	2,616	0	138	2,755	51,996	5.0
Timber Canyon	77,254	2,281	0	260	2,540	74,713	10.2
Flagstaff A – Burnt River Mountain	49,233	2,540	0	159	2,699	46,534	5.9
Flagstaff B	54,751	2,616	0	134	2,750	52,001	4.9
Flagstaff B – Burnt River West	52,334	2,583	0	140	2,723	49,611	5.2
Flagstaff B – Durkee	48,499	2,003	0	189	2,192	46,308	8.6
Tall Sagebrush Steppe							
Applicant's Proposed Action	163,864	1,941	0	864	2,805	161,058	30.8
Variation S3-A1	*31,611*	*560*	*0*	*203*	*763*	*30,848*	*26.6*
Variation S3-A2	*42,199*	*688*	*0*	*215*	*902*	*41,297*	*23.8*
Variation S3-B1	*63,441*	*819*	*0*	*238*	*1,057*	*62,385*	*22.5*
Variation S3-B2	*27,605*	*542*	*0*	*237*	*779*	*26,825*	*30.4*
Variation S3-B3	*27,605*	*542*	*0*	*227*	*769*	*26,835*	*29.5*
Variation S3-B4	*27,605*	*542*	*0*	*196*	*738*	*26,866*	*26.5*
Variation S3-B5	*27,605*	*542*	*0*	*204*	*746*	*26,858*	*27.3*
Variation S3-C1	*69,774*	*623*	*0*	*287*	*910*	*68,864*	*31.5*
Variation S3-C2	*69,774*	*623*	*0*	*283*	*906*	*68,868*	*31.2*
Variation S3-C3	*51,017*	*546*	*0*	*195*	*741*	*50,275*	*26.3*
Variation S3-C4	*51,017*	*546*	*0*	*217*	*763*	*50,253*	*28.4*

Table 3-716. Cumulative Effects Summary for Vegetation in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C5	*51,017*	*546*	*0*	*276*	*822*	*50,195*	*33.5*
Variation S3-C6	*43,377*	*279*	*0*	*320*	*599*	*42,779*	*53.5*
Flagstaff A	128,027	1,665	0	830	2,495	125,532	33.3
Timber Canyon	134,260	1,124	0	521	1,645	132,615	31.7
Flagstaff A – Burnt River Mountain	109,269	1,588	0	747	2,335	106,934	32.0
Flagstaff B	128,027	1,665	0	854	2,519	125,508	33.9
Flagstaff B – Burnt River West	119,858	1,716	0	874	2,590	117,268	33.7
Flagstaff B – Durkee	101,630	1,320	0	909	2,229	99,401	40.8
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

B2H Project implementation would result in the greatest incremental disturbance to Tall Sagebrush Steppe vegetation communities for all alternatives, including the Timber Canyon Alternative, and is expected to contribute up to 40 percent of the estimated cumulative disturbance. The Timber Canyon Alternative is expected to contribute the greatest amount of incremental disturbance to Dwarf Sagebrush Steppe, Mixed Conifer Forest, and Mountain Shrub, and RCA vegetation communities of any alternative route considered in Segment 3; however, other alternatives and variations may contribute greater amounts of incremental disturbance relative to estimated cumulative development. Of the variations near Durkee (Variation S3-C1, Variation S3-C2, Variation S3-C3, Variation S3-C4, Variation S3-C5, and Variation S3-C6), Variation S3-C6 contributes the greatest amount of incremental disturbance relative to estimated cumulative development for Tall Sagebrush Steppe, RCA, Native Grasslands, Mountain Shrub, and Aspen vegetation communities largely due to the lower amounts of existing cumulative disturbance in these vegetation communities (refer to Table 3-716).

Federally Listed and Candidate Plant Species

The federally listed plant, Howell's spectacular thelypody, is known to occur in the CIAA of all alternative routes considered in Segment 3. The impacts of B2H Project implementation on Howell's spectacular thelypody are anticipated to be minimal as the nearest known occurrence is approximately 1.9 miles from the centerline of any alternative route considered in Segment 3. Even if individuals are found during preconstruction surveys, direct loss of habitat or individuals is not anticipated to result from B2H Project-related disturbance as application of Selective Mitigation Measures 8 and 13 requiring avoidance and minimizing disturbance are expected to limit impacts on Howell's spectacular thelypody. Indirect negative impacts on habitat (i.e., habitat degradation) could occur adjacent to disturbance through changes to erosional patterns, dust deposition increased traffic, decreased

attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Past actions in the CIAA—in particular the historic urban and agricultural development in the Baker-Powder River Valley—have resulted in loss and degradation of Howell's spectacular thelypody habitat. Historic grazing practices, other soil-disturbing activities, and transport of non-native plant materials, likely have contributed to the prevalence of invasive weeds and associated effects on this species. Present actions occurring in Howell's spectacular thelypody habitat also are likely to result in loss or degradation of habitat, though it is assumed that mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Inadvertent habitat degradation in areas adjacent to ground-disturbing actions also is likely to occur with present actions.

Without detailed engineering and preconstruction surveys, the exact location of Howell's spectacular thelypody in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on this species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in Howell's spectacular thelypody habitat is anticipated to limit cumulative effects on this species. Additional measures developed through the Section 7 consultation process would further limit cumulative effects.

Implementation of the B2H Project could contribute incrementally the loss of Howell's spectacular thelypody habitat that has occurred or could occur in the CIAA. However, given the distance of known occurrences from any action alternative and B2H Project commitment to mitigation measures limiting impacts on federally listed or candidate plant species, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Other Sensitive Plant Species

B2H Project implementation could result in the types of potential effects on sensitive plant species and habitats similar to that expected for Segment 1. Past and present actions in the CIAA, such as residential development, mining operations, energy development, agricultural development, and transportation development, have resulted in the loss or degradation of sensitive plant species habitat similar to that described for Segment 1.

Without detailed engineering, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on sensitive plant species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in sensitive species habitat is anticipated to limit cumulative effects on sensitive plant species.

Implementation of the B2H Project could contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. However, given the extent of existing disturbance to sensitive plant species habitats and B2H Project commitment to mitigation measures limiting impacts

on sensitive plant resources, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Noxious Weeds

B2H Project implementation would result in the types of disturbance likely to increase the potential for noxious weed establishment and spread similar to that described for Segment 1. Past and present actions in the CIAA- such as residential development, mining operations, energy development, agricultural development, and transportation development- also are likely to have contributed to the prevalence and distribution of noxious weeds in the CIAA, although present actions are assumed to implement practices to prevent, treat, and monitor noxious weed invasions. The creation of a noxious weed management plan and implementation of other design features of the B2H Project for environmental protection to limit the spread and introduction of noxious weeds would be similar to that described for Segment 1.

Given the extent of existing disturbance, prevalence of noxious weeds, and commitment of the B2H Project and other RFFAs to limiting the establishment and spread of noxious weeds, implementation of the B2H Project is anticipated to minimally contribute to the cumulative effects of noxious weeds on vegetation resources in the CIAA.

Traditional Foods and Ethnobotanical Resources

Direct loss of vegetation communities providing traditional foods or ethnobotanical resources could result from ground-disturbing activities or construction of permanent or temporary features for the Proposed Action and all other alternative routes considered in Segment 3. Indirect effects reducing the availability and abundance of these resources could occur adjacent to disturbance through dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Conversion of native vegetation communities for agricultural or other development purposes has occurred in the CIAA, primarily in the areas surrounding Baker, Oregon and Durkee, Oregon, but also in the foothills of the Wallowa Mountains crossed by the Timber Canyon Alternative. Several other past and present actions in the CIAA identified in Table 3-715 also have resulted in reduced availability of traditional foods and ethnobotanical resources in the CIAA. However, native vegetation communities, primarily Tall Sagebrush Steppe, supporting traditional foods and ethnobotanical resources exist through the CIAA.

B2H Project implementation would contribute to the cumulative effects on native vegetation communities supporting traditional foods or ethnobotanical resources to varying degrees. The extent of cumulative effects on these vegetation communities is summarized in Table 3-716 and explained in greater detail in the analysis of cumulative effects on vegetation communities. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. The extent of cumulative effects on traditional foods and ethnobotanical resources would relate to the cumulative effects on native vegetation communities, but depend on several factors, including the location of traditional food and ethnobotanical resources relative to B2H

Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 4—Brogan

Vegetation Communities

Permanent loss of vegetation would occur with the construction of B2H Project features such as roads, tower pads, and buildings or maintenance of the 250-foot wide right-of-way. Temporary removal or crushing of vegetation in work areas or temporary access roads would result in disturbance to native vegetation communities, which increases the risk of weed establishment and spread. The types of potential direct and indirect effects are described in greater detail in Section 3.2.3.6.

Several past and present actions in the CIAA—such as mining operations, energy development, pipelines, transmission lines, and transportation development—are likely to have similarly affected native vegetation communities through removal of native vegetation, alteration to vegetation community structure, and introduction and spread of noxious weeds. Several active mining claims and prospective oil leases were identified as RFFAs throughout the CIAA, but were not included in the quantitative assessment as the incremental loss of native vegetation communities associated with developing these claims could not be determined. Table 3-717 summarizes the past and present development in the CIAA for Segment 4. The past and present actions identified below include those used to quantitatively assess incremental loss of native vegetation communities in the CIAA for Segment 4.

Table 3-717. Cumulative Development Activities for Vegetation Communities in Segment 4—Brogan

Vegetation Community	Past and Present Activities
Desert Shrub	• Aggregate/Mineral Mining • Pipelines • Roads • Residential Structures • Transmission Lines
Dwarf Sagebrush Steppe	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential and Communication Structures • Transmission Lines • Hunnington Wind Turbines
Mountain Shrub	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential and Other Structures • Transmission Lines • Hunnington Wind Turbines

Table 3-717. Cumulative Development Activities for Vegetation Communities in Segment 4—Brogan	
Vegetation Community	**Past and Present Activities**
Native Grasslands	• Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines • Hunnington Wind Turbines
Riparian Conservation Area	• Geothermal Development • Aggregate/Mineral Mining • Dams • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines • Hunnington Wind Turbines
Tall Sagebrush Steppe	• Geothermal Development • Aggregate/Mineral Mining • Pipelines • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines • Hunnington Wind Turbines

The 2015 Lime Hill Fire has affected all types of native vegetation communities in the CIAA for Segment 4. The greatest extent of effects were to the dominant vegetation communities in the CIAA-Tall Sagebrush Steppe, which face a serious risk of transition to annual grass dominated vegetation communities from the large patches of Non-native Grassland vegetation communities also present in the CIAA. However, rehabilitation and management efforts to reduce the spread and establishment of annual grasses through livestock exclusion, chemical controls, and reseeding efforts are anticipated to prevent the conversion of Tall Sagebrush Steppe and other native vegetation communities to annual grasslands (BLM 2015).

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 4 would contribute to and increase the cumulative impacts on several native vegetation communities Table 3-718. Vegetation communities cumulatively affected include Desert Shrub, Dwarf Sagebrush Steppe, Mountain Shrub, Native Grasslands, RCAs, and Tall Sagebrush Steppe. Aspen, Juniper and Mahogany Woodland, and Mixed Conifer Forest vegetation communities are not crossed by the Applicant's Proposed Action Alternative or any other alternative route in Segment 4, and cumulative effects on these vegetation communities are not expected. B2H Project implementation would contribute to the cumulative effects on native vegetation communities in

Segment 4 to varying degrees. Table 3-718 summarizes the extent of the vegetation community in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-718. Cumulative Effects Summary for Vegetation in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Desert Shrub							
Applicant's Proposed Action	3,485	14	0	0	14	3,471	None
Variation S4-A1	*80*	*1*	*0*	*0*	*1*	*80*	*None*
Variation S4-A2	*80*	*1*	*0*	*0*	*1*	*80*	*None*
Variation S4-A3	*80*	*1*	*0*	*0*	*1*	*80*	*None*
Tub Mountain South	2,817	14	0	8	22	2,795	34.4
Willow Creek	2,881	10	0	2	11	2,869	13.9
Dwarf Sagebrush Steppe							
Applicant's Proposed Action	19,184	74	0	38	112	19,072	33.6
Variation S4-A1	*4,345*	*35*	*0*	*8*	*43*	*4,303*	*17.6*
Variation S4-A2	*4,345*	*35*	*0*	*12*	*48*	*4,298*	*25.6*
Variation S4-A3	*4,345*	*35*	*0*	*11*	*46*	*4,299*	*23.3*
Tub Mountain South	7,753	47	0	30	78	7,676	39.3
Willow Creek	9,588	50	0	11	61	9,527	17.4
Mountain Shrub							
Applicant's Proposed Action	7,263	51	0	33	84	7,179	39.4
Variation S4-A1	*3,675*	*27*	*0*	*13*	*39*	*3,636*	*32.5*
Variation S4-A2	*3,675*	*27*	*0*	*11*	*37*	*3,638*	*29.2*
Variation S4-A3	*3,675*	*27*	*0*	*12*	*39*	*3,636*	*31.6*
Tub Mountain South	4,474	37	0	12	49	4,425	25.4
Willow Creek	4,637	29	0	11	40	4,598	27.6
Native Grasslands							
Applicant's Proposed Action	26,320	111	0	170	281	26,039	60.5
Variation S4-A1	*3,488*	*28*	*0*	*8*	*36*	*3,453*	*21.9*
Variation S4-A2	*3,488*	*28*	*0*	*7*	*35*	*3,453*	*20.0*
Variation S4-A3	*3,488*	*28*	*0*	*11*	*39*	*3,449*	*28.7*
Tub Mountain South	20,974	103	0	29	132	20,842	21.9
Willow Creek	18,641	71	0	22	92	18,549	23.4

Table 3-718. Cumulative Effects Summary for Vegetation in Segment 4—Brogan in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Riparian Conservation Area							
Applicant's Proposed Action	40,076	1,684	0	100	1,784	38,292	5.6
Variation S4-A1	*7,641*	*524*	*0*	*15*	*539*	*7,102*	*2.8*
Variation S4-A2	*7,641*	*524*	*0*	*14*	*538*	*7,103*	*2.6*
Variation S4-A3	*7,641*	*524*	*0*	*15*	*539*	*7,102*	*2.7*
Tub Mountain South	41,947	2,541	0	95	2,636	39,312	3.6
Willow Creek	28,296	1,341	0	87	1,428	26,868	6.1
Tall Sagebrush Steppe							
Applicant's Proposed Action	112,160	714	0	376	1,090	111,070	34.5
Variation S4-A1	*23,310*	*233*	*0*	*68*	*300*	*23,010*	*22.5*
Variation S4-A2	*23,310*	*233*	*0*	*53*	*285*	*23,025*	*18.5*
Variation S4-A3	*23,310*	*233*	*0*	*54*	*286*	*23,024*	*18.8*
Tub Mountain South	86,705	674	0	272	946	85,759	28.7
Willow Creek	79,362	495	0	363	858	78,504	42.3

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

B2H Project implementation would result in the greatest incremental disturbance to Tall Sagebrush Steppe vegetation communities for all alternative routes and variations, and is expected to contribute up to approximately 40 percent of the estimated cumulative disturbance. Except for Desert Shrub, the Applicant's Proposed Action Alternative is expected to contribute the greatest amount of incremental disturbance to all native vegetation communities in the CIAA, particularly contributing to Native Grassland vegetation communities when compared to other alternative routes. The Applicant's Proposed Action Alternative would result in the greatest incremental disturbance to native vegetation communities largely due to the length and greater extent of native vegetation communities west of Jamieson, Oregon that are crossed by the alternative route Table 3-718.

Federally Listed and Candidate Plant Species

Federally listed or candidate plant species are not known to occur in the CIAA of Applicant's Proposed Action Alternative or any other alternative route analyzed in Segment 4. As such, cumulative effects on these resources are not anticipated as a result of B2H Project implementation.

Other Sensitive Plant Species

B2H Project implementation could result in the types of potential effects on sensitive plant species and habitats similar to that expected for Segment 1. Past and present actions in the CIAA, such as residential development, mining operations, energy development, agricultural development, and

transportation development, have resulted in the loss or degradation of sensitive plant species habitat similar to that described for Segment 1.

Without detailed engineering, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on sensitive plant species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in sensitive species habitat is anticipated to limit cumulative effects on sensitive plant species.

Implementation of the B2H Project could contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. However, given the extent of existing disturbance to sensitive plant species habitats and B2H Project commitment to mitigation measures limiting impacts on sensitive plant resources, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Noxious Weeds

B2H Project implementation would result in the types of disturbance likely to increase the potential for noxious weed establishment and spread similar to that described for Segment 1. Past and present actions in the CIAA- such as residential development, mining operations, energy development, agricultural development, and transportation development- also are likely to have contributed to the prevalence and distribution of noxious weeds in the CIAA, although present actions are assumed to implement practices to prevent, treat, and monitor noxious weed invasions. The creation of a noxious weed management plan and implementation of other design features of the B2H Project for environmental protection to limit the spread and introduction of noxious weeds would be similar to that described for Segment 1.

Given the extent of existing disturbance, prevalence of noxious weeds, and commitment of the B2H Project and other RFFAs to limiting the establishment and spread of noxious weeds, implementation of the B2H Project is anticipated to minimally contribute to the cumulative effects of noxious weeds on vegetation resources in the CIAA.

Traditional Foods and Ethnobotanical Resources

Direct loss of vegetation communities providing traditional foods or ethnobotanical resources could result from ground-disturbing activities or construction of permanent or temporary features for the Proposed Action and all other alternative routes considered in Segment 4. Indirect effects reducing the availability and abundance of these resources could occur adjacent to disturbance through dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Conversion of native vegetation communities for agricultural or other development purposes has occurred in the CIAA, primarily in the areas surrounding Jamieson and the Willow Creek Valley. Additional loss of native vegetation communities near Tub Mountain through conversion to Non-native Grasslands has likely reduced the availability of traditional foods and ethnobotanical resources in the

surrounding areas. Several other past and present actions in the CIAA identified in Table 3-717 also have resulted in reduced availability of traditional foods and ethnobotanical resources in the CIAA. However, native vegetation communities, primarily Tall Sagebrush Steppe and Native Grasslands, supporting traditional foods and ethnobotanical resources exist through the CIAA.

B2H Project implementation would contribute to the cumulative effects on native vegetation communities supporting traditional foods or ethnobotanical resources to varying degrees. The extent of cumulative effects on these vegetation communities is summarized in Table 3-718 and explained in greater detail in the analysis of cumulative effects on vegetation communities. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. The extent of cumulative effects on traditional foods and ethnobotanical resources would relate to the cumulative effects on native vegetation communities, but depend on several factors, including the location of traditional food and ethnobotanical resources relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 5—Malheur

Vegetation Communities

Permanent loss of vegetation would occur with the construction of B2H Project features such as roads, tower pads, and buildings or maintenance of the 250-foot wide right-of-way. Temporary removal or crushing of vegetation in work areas or temporary access roads would result in disturbance to native vegetation communities, which increases the risk of weed establishment and spread. The types of potential direct and indirect effects are described in greater detail in Section 3.2.3.6.

Several past and present actions in the CIAA—such as residential development, mining operations, energy development, pipelines, transmission lines, and transportation development—are likely to have similarly affected native vegetation communities through removal of native vegetation, alteration to vegetation community structure, and introduction and spread of noxious weeds. Several active mining claims and prospective oil leases were identified as RFFAs throughout the CIAA, but were not included in the quantitative assessment as the incremental loss of native vegetation communities associated with developing these claims could not be determined. Table 3-719 summarizes the past and present development in the CIAA for Segment 5. The past and present actions identified below include those used to quantitatively assess incremental loss of native vegetation communities in the CIAA for Segment 5. The instillation of fiber optic cable by the Oregon Telephone Company near Westfall, Oregon would have resulted in disturbance all types of native vegetation communities present in the CIAA, but was not included in the quantitative assessment as reliable data depicting the extent of disturbance was not available.

Table 3-719. Cumulative Development Activities for Vegetation Communities Segment 5—Malheur

Vegetation Community	Past and Present Activities
Desert Shrub	• Aggregate/Mineral Mining • Railroads • Roads • Communication and Other Structures • Transmission Lines
Dwarf Sagebrush Steppe	• Aggregate/Mineral Mining • Roads • Residential and Other Structures • Transmission Lines
Native Grasslands	• Aggregate/Mineral Mining • Grassy Mountain Gold Mine • Railroad • Road • Residential, Communication, and Other Structures • Transmission Lines
Riparian Conservation Area	• Aggregate/Mineral Mining • Grassy Mountain Gold Mine • Dams • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines
Tall Sagebrush Steppe	• Aggregate/Mineral Mining • Grassy Mountain Gold Mine • Railroads • Roads • Residential, Communication, and Other Structures • Transmission Lines

The 2015 Soda Fire has affected all types of native vegetation communities at the southern end of the CIAA of Segment 5. The greatest extent of effects were to the dominant vegetation communities in the CIAA- Tall Sagebrush Steppe, which face a serious risk of transition to annual grass dominated vegetation communities from the large patches of Non-native Grassland vegetation communities also present in the CIAA. In the portion of the Soda Fire located in Oregon and the CIAA of Segment 5, rehabilitation and management efforts to reduce the spread and establishment of annual grasses through chemical controls and reseeding efforts are anticipated to prevent the conversion of Tall Sagebrush Steppe and other native vegetation communities to annual grasslands (BLM 2015). In addition to the Soda Fire, several other fires, including the 2005 Double Mountain, 2001 Cow Hollow, and 2013 Owyhee fires, have affected all types of native vegetation communities throughout the CIAA.

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 5 would contribute to and increase the cumulative impacts on several native vegetation communities (refer to Table 3-720). Vegetation communities cumulatively affected include

Desert Shrub, Dwarf Sagebrush Steppe, Native Grasslands, RCAs, and Tall Sagebrush Steppe. Aspen, Mountain Shrub, Juniper and Mahogany Woodland, and Mixed Conifer Forest vegetation communities are not crossed by the Applicant's Proposed Action Alternative or any other alternative route in Segment 5, and cumulative effects on these vegetation communities are not expected. B2H Project implementation would contribute to the cumulative effects on native vegetation communities in Segment 5 to varying degrees. Table 3-720 summarizes the extent of the vegetation community in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-720. Cumulative Effects Summary for Vegetation in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Desert Shrub							
Applicant's Proposed Action	4,212	50	0	2	53	4,159	4.6
Variation S5-A1	*553*	*7*	*0*	*0*	*7*	*547*	*None*
Variation S5-A2	*553*	*7*	*0*	*2*	*8*	*545*	*21.0*
Variation S5-B1	*308*	*4*	*0*	*0*	*5*	*303*	*9.3*
Variation S5-B2	*308*	*4*	*0*	*0*	*4*	*304*	*None*
Malheur S	4,301	40	0	8	48	4,253	16.7
Malheur A	4,301	40	0	6	46	4,255	12.6
Dwarf Sagebrush Steppe							
Applicant's Proposed Action	4,332	16	0	3	18	4,313	15.5
Variation S5-A1	*772*	*1*	*0*	*0*	*1*	*771*	*None*
Variation S5-A2	*772*	*1*	*0*	*0*	*1*	*771*	*None*
Variation S5-B1	*466*	*5*	*0*	*0*	*5*	*461*	*None*
Variation S5-B2	*466*	*5*	*0*	*0*	*5*	*461*	*8.2*
Malheur S	4,824	23	0	1	24	4,800	2.8
Malheur A	4,824	23	0	3	26	4,798	10.2
Native Grasslands							
Applicant's Proposed Action	12,422	58	0	26	84	12,338	30.7
Variation S5-A1	*3,465*	*8*	*0*	*0*	*8*	*3,457*	*None*
Variation S5-A2	*3,465*	*8*	*0*	*0*	*8*	*3,457*	*4.7*
Variation S5-B1	*977*	*7*	*0*	*2*	*10*	*967*	*25.7*
Variation S5-B2	*977*	*7*	*0*	*1*	*8*	*968*	*14.6*
Malheur S	16,647	115	0	37	152	16,495	24.2
Malheur A	16,647	115	0	49	164	16,483	29.7

Table 3-720. Cumulative Effects Summary for Vegetation in Segment 5—Malheur in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Riparian Conservation Area							
Applicant's Proposed Action	47,903	2,497	0	59	2,556	45,347	2.3
Variation S5-A1	11,561	462	0	11	473	11,088	2.4
Variation S5-A2	11,561	462	0	10	472	11,089	2.2
Variation S5-B1	3,957	265	0	12	277	3,681	4.2
Variation S5-B2	3,957	265	0	18	283	3,675	6.3
Malheur S	32,621	1,112	0	85	1,198	31,423	7.1
Malheur A	32,621	1,112	0	80	1,192	31,429	6.7
Tall Sagebrush Steppe							
Applicant's Proposed Action	107,567	696	0	387	1,083	106,483	35.7
Variation S5-A1	*56,217*	*224*	*0*	*32*	*256*	*55,961*	*12.7*
Variation S5-A2	*56,217*	*224*	*0*	*38*	*262*	*55,955*	*14.6*
Variation S5-B1	*12,192*	*96*	*0*	*32*	*128*	*12,063*	*24.8*
Variation S5-B2	*12,192*	*96*	*0*	*18*	*114*	*12,077*	*15.6*
Malheur S	113,856	938	0	471	1,409	112,447	33.4
Malheur A	113,856	938	0	482	1,420	112,436	33.9

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

B2H Project implementation would result in the greatest incremental disturbance to Tall Sagebrush Steppe vegetation communities for all alternative routes and route variations, and is expected to contribute up to approximately 35 percent of the estimated cumulative disturbance. Incremental disturbance to Desert Shrub and Dwarf Sagebrush Steppe vegetation communities is expected for all alternatives and variations and would contribute up to approximately 16 percent of the estimated cumulative development, but would result in minimal disturbance (less than 1 percent) for both vegetation communities relative to the total extent of both vegetation communities identified in the CIAA. Both the Malheur S and Malheur A alternatives are expected to contribute greater amounts of incremental disturbance to Native Grasslands, RCA, and Tall Sagebrush Steppe vegetation communities than the Applicant's Proposed Action Alternative.

Federally Listed and Candidate Plant Species

Federally listed or candidate plant species are not known to occur in the CIAA of Applicant's Proposed Action Alternative or any other alternative route analyzed in Segment 5. As such, cumulative effects on these resources are not anticipated as a result of B2H Project implementation.

Other Sensitive Plant Species

B2H Project implementation could result in the types of potential effects on sensitive plant species and habitats similar to that expected for Segment 1. Past and present actions in the CIAA, such as residential development, mining operations, energy development, agricultural development, and transportation development, have resulted in the loss or degradation of sensitive plant species habitat similar to that described for Segment 1.

Without detailed engineering, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on sensitive plant species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in sensitive species habitat is anticipated to limit cumulative effects on sensitive plant species.

Implementation of the B2H Project could contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. However, given the extent of existing disturbance to sensitive plant species habitats and B2H Project commitment to mitigation measures limiting impacts on sensitive plant resources, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Noxious Weeds

B2H Project implementation would result in the types of disturbance likely to increase the potential for noxious weed establishment and spread similar to that described for Segment 1. Past and present actions in the CIAA- such as residential development, mining operations, energy development, agricultural development, and transportation development- also are likely to have contributed to the prevalence and distribution of noxious weeds in the CIAA, although present actions are assumed to implement practices to prevent, treat, and monitor noxious weed invasions. The creation of a noxious weed management plan and implementation of other design features of the B2H Project for environmental protection to limit the spread and introduction of noxious weeds would be similar to that described for Segment 1.

Given the extent of existing disturbance, prevalence of noxious weeds, and commitment of the B2H Project and other RFFAs to limiting the establishment and spread of noxious weeds, implementation of the B2H Project is anticipated to minimally contribute to the cumulative effects of noxious weeds on vegetation resources in the CIAA.

Traditional Foods and Ethnobotanical Resources

Direct loss of vegetation communities providing traditional foods or ethnobotanical resources could result from ground-disturbing activities or construction of permanent or temporary features for the Proposed Action and all other alternative routes considered in Segment 5. Indirect effects reducing the availability and abundance of these resources could occur adjacent to disturbance through dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Conversion of native vegetation communities for agricultural or other development purposes has occurred in the CIAA, primarily in the areas surrounding Vale, Oregon and Lake Owyhee. Additional loss of native vegetation communities throughout the CIAA through conversion to Non-native Grasslands has likely reduced the availability of traditional foods and ethnobotanical resources in the surrounding areas. Several other past and present actions in the CIAA identified in Table 3-719 also have resulted in reduced availability of traditional foods and ethnobotanical resources in the CIAA. However, native vegetation communities, primarily Tall Sagebrush Steppe, RCA and Native Grasslands, supporting traditional foods and ethnobotanical resources exist throughout the CIAA.

B2H Project implementation would contribute to the cumulative effects on native vegetation communities supporting traditional foods or ethnobotanical resources to varying degrees. The extent of cumulative effects on these vegetation communities is summarized in Table 3-720 and explained in greater detail in the analysis of cumulative effects on vegetation communities. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. The extent of cumulative effects on traditional foods and ethnobotanical resources would relate to the cumulative effects on native vegetation communities, but depend on several factors, including the location of traditional food and ethnobotanical resources relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

Segment 6—Treasure Valley

Vegetation Communities

Permanent loss of vegetation would occur with the construction of B2H Project features such as roads, tower pads, and buildings or maintenance of the 250-foot wide right-of-way. Temporary removal or crushing of vegetation in work areas or temporary access roads would result in disturbance to native vegetation communities, which increases the risk of weed establishment and spread. The types of potential direct and indirect effects are described in greater detail in Section 3.2.3.6.

Several past and present actions in the CIAA—such as residential development, gravel and aggregate mining operations, transmission lines, and transportation development—are likely to have similarly affected native vegetation communities through removal of native vegetation, alteration to vegetation community structure, and introduction and spread of noxious weeds. Several active mining claims were identified as RFFAs throughout the CIAA, but were not included in the quantitative assessment as the incremental loss of native vegetation communities associated with developing these claims could not be determined. Table 3-721 summarizes the past and present development in the CIAA for Segment 6. The past and present actions identified below include those used to quantitatively assess incremental loss of native vegetation communities in the CIAA for Segment 6.

Table 3-721. Cumulative Development Activities for Vegetation Communities Segment 6—Treasure Valley	
Vegetation Community	**Past and Present Activities**
Desert Shrub	• Aggregate/Mineral Mining • Roads • Residential, Communication, and Other Structures • Gateway West and Other Transmission Lines
Juniper and Mahogany Woodland	• Aggregate/Mineral Mining • Roads
Native Grasslands	• Aggregate/Mineral Mining • Roads • Communication and Other Structures • Transmission Lines
Riparian Conservation Area	• Aggregate/Mineral Mining • Dam • Railroads • Roads • Residential, Communication, and Other Structures • Gateway West and Other Transmission Lines
Tall Sagebrush Steppe	• Aggregate/Mineral Mining • Road • Residential, Communication, and Other Structures • Gateway West and Other Transmission Lines

The 2015 Soda Fire has affected all types of native vegetation communities throughout the CIAA of Segment 6. The greatest extents of effects were to the dominant vegetation communities in the CIAA-Non-native Grasslands, Bare Ground, Cliffs and Talus, and Tall Sagebrush Steppe. Of these communities, the Soda Fire most affected Tall Sagebrush Steppe through reducing shrub and bunchgrass cover and increasing the risk of transition to annual grass dominated vegetation communities (Miller et al. 2013). Several rehabilitation and management efforts to reduce annual grass establishment and restore native vegetation communities through reseeding and planting of several shrub, forb, and bunchgrass species are anticipated to prevent the conversion of Tall Sagebrush Steppe and other native vegetation communities to annual grasslands (BLM 2015).

When considered with other actions, the Applicant's Proposed Action Alternative and all variations in Segment 6 would contribute to and increase the cumulative impacts on several native vegetation communities (refer to Table 3-722). Vegetation communities cumulatively affected include Desert Shrub, Juniper and Mahogany Woodlands, Native Grasslands, RCAs, and Tall Sagebrush Steppe. Aspen, Mountain Shrub, Dwarf Sagebrush Steppe, and Mixed Conifer Forest vegetation communities are not crossed by the Applicant's Proposed Action Alternative or any other alternative route in Segment 6, and cumulative effects on these vegetation communities are not expected. B2H Project implementation would contribute to the cumulative effects on native vegetation communities in Segment 6 to varying degrees. Table 3-722 summarizes the extent of the vegetation community in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance

resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-722. Cumulative Effects Summary for Vegetation in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Desert Shrub							
Applicant's Proposed Action	7,704	314	0	44	358	7,346	12.2
Variation S6-A1	*2,937*	*95*	*0*	*2*	*97*	*2,840*	*2.5*
Variation S6-A2	*2,937*	*95*	*0*	*2*	*97*	*2,840*	*2.5*
Variation S6-B1	*5,123*	*226*	*0*	*24*	*250*	*4,873*	*9.6*
Variation S6-B2	*5,123*	*226*	*0*	*11*	*237*	*4,886*	*4.7*
Juniper and Mahogany Woodland							
Applicant's Proposed Action	1,070	2	0	0	2	1,067	None
Variation S6-A1	*17*	*0*	*0*	*0*	*0*	*17*	*None*
Variation S6-A2	*17*	*0*	*0*	*0*	*0*	*17*	*None*
Variation S6-B1	*478*	*1*	*0*	*0*	*1*	*477*	*None*
Variation S6-B2	*478*	*1*	*0*	*2*	*2*	*476*	*74.2*
Native Grasslands							
Applicant's Proposed Action	6,482	52	0	3	55	6,427	5.5
Variation S6-A1	*1,174*	*17*	*0*	*1*	*18*	*1,156*	*6.2*
Variation S6-A2	*1,174*	*17*	*0*	*0*	*17*	*1,157*	*None*
Variation S6-B1	*4,463*	*36*	*0*	*2*	*38*	*4,426*	*5.2*
Variation S6-B2	*4,463*	*36*	*0*	*5*	*41*	*4,422*	*13.3*
Riparian Conservation Area							
Applicant's Proposed Action	15,038	580	0	46	625	14,413	7.3
Variation S6-A1	*7,588*	*275*	*0*	*20*	*295*	*7,293*	*6.7*
Variation S6-A2	*7,588*	*275*	*0*	*10*	*285*	*7,303*	*3.5*
Variation S6-B1	*7,260*	*297*	*0*	*16*	*314*	*6,947*	*5.2*
Variation S6-B2	*7,260*	*297*	*0*	*16*	*313*	*6,947*	*5.0*
Tall Sagebrush Steppe							
Applicant's Proposed Action	57,930	1,226	0	222	1,448	56,482	15.3
Variation S6-A1	*19,856*	*610*	*0*	*82*	*692*	*19,164*	*11.9*
Variation S6-A2	*19,856*	*610*	*0*	*88*	*697*	*19,159*	*12.6*
Variation S6-B1	*32,053*	*540*	*0*	*122*	*662*	*31,391*	*18.4*
Variation S6-B2	*32,053*	*540*	*0*	*161*	*701*	*31,352*	*22.9*

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

The Applicant's Proposed Action Alternative and all variations would result in the greatest incremental disturbance to Tall Sagebrush Steppe vegetation communities. Due to the similar alignments of Variation S6-A1 and Variation S6-A2, the extent of vegetation communities and past and present development in the CIAA and the resulting estimated cumulative development in each vegetation community would be similar between the two variations. However, Variation S6-A1 would contribute more incremental disturbance to RCA vegetation communities than Variation S6-A2 as it crosses RCA vegetation communities to a greater extent. Variation S6-B1 and Variation S6-B2 also follow similar alignments and the extent of estimated cumulative development in each vegetation community would be similar between the two variations. Variation S6-B2 crosses Tall Sagebrush Steppe and Juniper Mahogany Woodlands to a greater extent than Variation S6-B1 and would result in greater incremental disturbance to both these communities.

Federally Listed and Candidate Plant Species

Federally listed or candidate plant species are not known to occur in the CIAA of Applicant's Proposed Action Alternative or any other alternative route analyzed in Segment 6. As such, cumulative effects on these resources are not anticipated as a result of B2H Project implementation.

Other Sensitive Plant Species

B2H Project implementation could result in the types of potential effects on sensitive plant species and habitats similar to that expected for Segment 1. Past and present actions in the CIAA, such as residential development, mining operations, energy development, agricultural development, and transportation development, have resulted in the loss or degradation of sensitive plant species habitat similar to that described for Segment 1.

Without detailed engineering, the exact location of sensitive plant species in relation to B2H Project features is not available and a quantitative assessment of cumulative effects on sensitive plant species cannot be provided. However, the application of several design features of the B2H Project for environmental protection and selective mitigation measures requiring preconstruction surveys and spanning, avoidance, or minimization of disturbance in sensitive species habitat is anticipated to limit cumulative effects on sensitive plant species.

Implementation of the B2H Project could contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. However, given the extent of existing disturbance to sensitive plant species habitats and B2H Project commitment to mitigation measures limiting impacts on sensitive plant resources, cumulative effects from implementation of the B2H Project are anticipated to be minimal.

Noxious Weeds

B2H Project implementation would result in the types of disturbance likely to increase the potential for noxious weed establishment and spread similar to that described for Segment 1. Past and present actions in the CIAA- such as residential development, mining operations, energy development, agricultural development, and transportation development- also are likely to have contributed to the prevalence and distribution of noxious weeds in the CIAA, although present actions are assumed to

implement practices to prevent, treat, and monitor noxious weed invasions. The creation of a noxious weed management plan and implementation of other design features of the B2H Project for environmental protection to limit the spread and introduction of noxious weeds would be similar to that described for Segment 1.

Given the extent of existing disturbance, prevalence of noxious weeds, and commitment of the B2H Project and other RFFAs to limiting the establishment and spread of noxious weeds, implementation of the B2H Project is anticipated to minimally contribute to the cumulative effects of noxious weeds on vegetation resources in the CIAA.

Traditional Foods and Ethnobotanical Resources

Direct loss of vegetation communities providing traditional foods or ethnobotanical resources could result from ground-disturbing activities or construction of permanent or temporary features for the Applicant's Proposed Action Alternative or all variations considered in Segment 6. Indirect effects reducing the availability and abundance of these resources could occur adjacent to disturbance through dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.3.6 for more detailed information).

Conversion of native vegetation communities for agricultural or other development purposes has occurred in the CIAA, primarily in the floodplains south of the Snake River. Additional loss of native vegetation communities throughout the CIAA through conversion to Non-native Grasslands has likely reduced the availability of traditional foods and ethnobotanical resources in the surrounding areas. Several other past and present actions in the CIAA identified in Table 3-721 also have resulted in reduced availability of traditional foods and ethnobotanical resources in the CIAA. The recent Soda Fire has affected all types of native vegetation communities throughout the CIAA and has likely reduced the availability of traditional foods and ethnobotanical resources in Segment 6. However, areas supporting traditional foods and ethnobotanical resources may still in exist in areas less affected by fire or in vegetation communities with greater resistance and resilience to wildfire disturbance.

B2H Project implementation would contribute to the cumulative effects on native vegetation communities supporting traditional foods or ethnobotanical resources to varying degrees. The extent of cumulative effects on these vegetation communities is summarized in Table 3-722 and explained in greater detail in the analysis of cumulative effects on vegetation communities. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of these vegetation communities in the CIAA. The extent of cumulative effects on traditional foods and ethnobotanical resources would relate to the cumulative effects on native vegetation communities, but depend on several factors, including the location of traditional food and ethnobotanical resources relative to B2H Project features and the development of site-specific mitigation measures during government-to-government consultation.

3.3.3.4 Wildlife Resources

This section estimates cumulative effects on wildlife resources from B2H Project effects in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.4.

The geographic and temporal scopes of analysis (i.e., the CIAA; refer to Table 3-638) were established for wildlife species or resource groups based on the best available information regarding species-specific home ranges or territory sizes.

Issues Identified for Analysis

Potential impacts on migratory birds, big game, and special status species were identified as cumulative effects issues by the agencies and during public scoping, including gray wolf, Columbia spotted frog, Greater Sage-Grouse, and Washington ground squirrel,. The cumulative effects analysis for the aforementioned wildlife resources addresses the potential effects of the B2H Project, other past and present actions, and RFFAs and their contribution to loss, fragmentation, and modification of the wildlife resources' habitat.

Existing Condition

Wildlife species that were identified as cumulative effects issues and the vegetation communities that provide wildlife habitat are described at the beginning of Section 3.2.3.4. The existing condition of wildlife and wildlife habitat also are described for the Proposed Action and all alternatives and variations by B2H Project Segment in Section 3.2.3.4. Habitat for big game, bald or golden eagles, migratory birds, and special status species occurs in each of the segments. Washington ground squirrel habitat is present only in Segment 1 (MV-8), Columbia spotted frog in Segments 5 and 6 (MV-8), and Greater Sage-Grouse in Segments 2 through 6 (MV-9). In addition to the affected environment described for Greater Sage-Grouse in Section 3.2.3.4, large portions of PHMA, GHMA, and Important Habitat Management Areas (IHMA) for Greater Sage-Grouse occur in the CIAA throughout Segments 2 through 6, as displayed in MV-9; no Sagebrush Focal Areas are present in the CIAA.

Traditional Foods

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on wildlife resources that are considered traditional foods by Native American tribes. These resources include big game and waterfowl and are analyzed below (waterfowl are analyzed under Migratory Birds Including Raptors as riparian/wetland species). Exercise of treaty rights by Native American tribes could include, but is not limited to, hunting of small and large game for economic, religious, and cultural use. B2H Project impacts on wildlife have the potential to affect tribal exercise of these rights. Potential direct effects on wildlife resources of tribal concern include altered availability and changes in habitats of these resources. Potential indirect effects include impacts on ability to gather traditional foods (e.g., decreased access to traditional use areas established by treaties), effects on indigenous peoples relationships with traditional foods, effects on tribal culture and livelihood and health (physical, mental, spiritual), and impacts on retaining traditional knowledge.

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

Wildlife Habitat

Direct, indirect, and cumulative effects on wildlife habitat are the same as direct, indirect, and cumulative effects on the vegetation communities discussed in Section 3.2.3 and the vegetation section above (Section 3.3.4.3), and are not discussed separately here.

Federally Proposed, Endangered, Threatened, and Candidate Species

Gray Wolf

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on gray wolves. The direct effects from the B2H Project on gray wolves would include habitat displacement, degradation and fragmentation; disturbance; and injury or mortality. Indirect effects from the B2H Project would include increased disturbance and mortality associated with increased human access and activity (e.g., increased illegal hunting of gray wolves), and periodic disturbance and noise associated with vehicle use and human presence during maintenance activities subsequent to construction.

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the B2H Project would have short-term high residual impacts on federally endangered gray wolves from potential mortality and long-term moderate residual impacts from disturbance or displacement from habitat that would not severely limit the long-term sustainability of populations. Types of potential direct and indirect effects on gray wolf are discussed further in Section 3.2.4.6.

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of gray wolf habitat resulting from the past and present actions and RFFAs in the CIAA. Wolves are habitat generalists and historically used or traveled through all habitat types in the CIAA. However, gray wolves are now generally limited to large protected areas with minimal human conflicts, such as ODFW-designated wolf use areas (refer to Section 3.2.4.5 for description of the proximity of alternative routes relative to wolf use areas). Also, gray wolf habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on gray wolves would be anticipated to be relatively small compared to the combined effects of other actions.

Other Special Status Species

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for special status species. The amount of disturbance of vegetation community types used as habitat by special status species are compared by alternative route in Table 3-120 in Section 3.2.3. Refer to Table 3-142 in Section 3.2.4.5 for a list of special status species in the B2H Project area.

The direct effects from the B2H Project on special status species would include mortality or injury, disturbance, habitat fragmentation and degradation, and loss or modification of habitat. Indirect effects

from the B2H Project would include degradation of habitat quality as a result of weed infestations following construction and associated increased potential for rangeland wildfire, increased avian predation (on special status prey species), and increased disturbance and mortality or injury associated with increased human access and activity. Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) and the criteria for duration of impacts described under Methods in Section 3.2.4.4, the B2H Project would have long-term moderate residual impacts on special status species from potential mortality (without population-level effects) and temporary disturbance during critical or sensitive periods. Types of potential direct and indirect effects on special status species are discussed further in Section 3.2.2.6 under Effects Common to All Wildlife Species.

The cumulative effects on vegetation community types used as habitat by special status species are compared by alternative route in Table 3-712 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for special status wildlife are presented in Table 3-711 in Section 3.3.3.3. Collision risk for bird species in the CIAA on is discussed under Migratory Birds Including Raptors.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, special status bird habitat along the Applicant's Proposed Action Alternative, Applicant's Proposed Action – Southern Route, and West of Bombing Range Road – Southern route could be affected by wildfires and military activities on the NWSTF Boardman. Special status bird species that occupy the NWSTF Boardman include burrowing owl, grasshopper sparrow, long-billed curlew, golden eagle, ferruginous hawk, and Swainson's hawk. Impacts on special status birds and other migratory birds that inhabit the NWSTF Boardman are discussed under Migratory Birds Including Raptors.

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of special status species habitat resulting from the past and present actions and RFFAs in the CIAA. Special status species habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on special status species habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Washington Ground Squirrel

Throughout much of its range, Washington ground squirrels are threatened by habitat loss, fragmentation, and degradation due to the establishment and spread of invasive plant species, particularly cheatgrass, which alters available cover and food quantity and quality, and increases fire intervals. Additional threats include recreational shooting, genetic isolation and drift, predation, disease, drought, and possible competition with related species in disturbed habitat at the periphery of their range.

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Washington ground squirrel. The direct effects from the B2H Project on Washington ground squirrel would include habitat loss, modification, and degradation, mortality and injury, and disturbance from construction and maintenance activities. Indirect effects from the B2H Project would include habitat loss

or modification due to altered fire regimes, facilitation of invasive plant establishment; disturbance from an increase in recreational access from B2H Project access roads; and mortality from increased avian predation.

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the B2H Project would have short-term high residual impacts from potential mortality to individuals in occupied colony avoidance areas and occupied colony dispersal areas and long-term moderate residual impacts from permanent loss and/or modification of occupied and suitable habitat (Refer to map MV-8 and Table 3-146). Types of potential direct and indirect effects on Washington ground squirrel are discussed further in Section 3.2.4.6.

Past and present actions in the CIAA that have likely affected Washington ground squirrel habitat include:

- Aggregate/mineral mining
- Communication towers
- Residential and commercial development
- Pipelines
- Roads
- Wind-energy facilities
- Transmission lines
- Railroads
- Wildfire

RFFAs in the CIAA for Washington ground squirrel habitat for the B2H Project include:

- Wind-energy facilities (Wheatridge Wind Turbines and Buttercreek Wind Turbines)
- Oil and gas development

A summary of the cumulative effects analysis is presented in Table 3-723.

Table 3-723. Cumulative Effects Summary for Washington Ground Squirrel in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Occupied Colony Avoidance Areas							
Applicant's Proposed Action	1,957	31	2	2	35	1,922	7.2
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
East of Bombing Range Road	1,957	31	2	10	42	1,915	23.2
Applicant's Proposed Action – Southern Route	1,957	31	2	3	35	1,922	7.3
West of Bombing Range Road – Southern Route	0	0	0	0	0	0	None
Longhorn	1,957	31	2	8	40	1,917	19.5
Interstate 84	0	0	0	0	0	0	None
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	0	0	0	0	0	0	None
Occupied Colony Dispersal Areas							
Applicant's Proposed Action	17,874	252	12	64	328	17,546	19.4
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
East of Bombing Range Road	17,874	252	12	57	321	17,552	17.8
Applicant's Proposed Action – Southern Route	17,874	252	12	65	329	17,545	19.6
West of Bombing Range Road – Southern Route	17,874	252	12	23	287	17,586	8.0
Longhorn	17,874	252	12	81	345	17,529	23.4

Table 3-723. Cumulative Effects Summary for Washington Ground Squirrel in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	0	0	0	0	0	0	None
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	0	0	0	0	0	0	None
Suitable Habitat							
Applicant's Proposed Action	109,626	1,140	579	140	1,859	107,767	7.5
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
East of Bombing Range Road	109,343	1,108	579	168	1,855	107,488	9.1
Applicant's Proposed Action – Southern Route	114,226	1,183	579	162	1,924	112,301	8.4
West of Bombing Range Road – Southern Route	104,126	1,040	1,210	187	2,437	101,689	7.7
Longhorn	87,884	934	579	131	1,644	86,240	8.0
Interstate 84	48,965	1,030	0	103	1,133	47,833	9.1
Variation S1-A1	*27,551*	*446*	*0*	*20*	*466*	*27,085*	*4.3*
Variation S1-A2	*40,817*	*564*	*0*	*241*	*804*	*40,013*	*30.0*
Interstate 84 – Southern Route	57,250	1,109	0	126	1,235	56,014	10.2

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of Washington ground squirrel habitat resulting from the past and present actions and RFFAs in the CIAA.

Washington ground squirrel habitat along the Applicant's Proposed Action Alternative, Applicant's Proposed Action – Southern Route, and West of Bombing Range Road – Southern route has been and will likely continue to be affected by wildfires and military activities on the NWSTF Boardman. In addition to the 2015 Boardman fire, numerous other fires have occurred since 1998, ranging in extent from 600 to 18,000 acres (Navy 2012). Wildfires historically occur on the NWSTF Boardman at approximate 20- to 50-year intervals, but now occur at greater frequency and intensity with the increase

of fuel from the spread of cheatgrass and other non-native annual grasses (Navy 2015). The influx of wildfire has caused short- and long-term alterations to habitat for Washington ground squirrel and other wildlife on the NWSTF Boardman (Navy 2012). Loss of vegetative cover from wildfires increases susceptibility to predation and reduces forage abundance for Washington ground squirrel (Navy 2015). The spread of non-native plants in post-burn areas also decreases the quality of forage for Washington ground squirrel. Impacts from approved military activities on the NWSTF Boardman include noise disturbance from aircraft overflight, small arms firing, non-explosive practice munitions striking a target or the ground, and vehicle and equipment operations; alteration of habitat by decreasing vegetative cover and disturbing surface soils for firebreak maintenance; and physical strikes from vehicles and equipment (Navy 2015).

Approved military activities on NWSTF Boardman would result in Washington ground squirrel mortality and loss and degradation of Washington ground squirrel habitat, all of which is considered occupied habitat by the Navy (2015). In coordination with the USFWS, the Navy developed conservation measures to avoid, minimize, and mitigate impacts on Washington ground squirrel. A Conference Opinion was issued by the USFWS stating that the proposed activities would not likely jeopardize the continued existence of Washington ground squirrel (Navy 2015).

Under all alternative routes, the majority of Washington ground squirrel habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Washington ground squirrel habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Migratory Birds Including Raptors

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for migratory birds and raptors. The amount of disturbance of vegetation community types used as habitat by migratory bird and raptor species are compared by alternative route in Table 3-120. Migratory bird habitats that would be disturbed, species that may be affected, and known bald and golden eagle nest occurrences are described in Section 3.2.4.5.

Direct and indirect effects from the B2H Project on migratory birds and raptors would include loss or modification of habitat; collisions with construction vehicles, power lines, other equipment, or structures; direct removal of nesting habitat; destruction of unoccupied nests; induced abandonment of nests due to disturbance; electrocution; fugitive dust; noise and visual disturbance; and electric and magnetic field (EMF) exposure. Types of potential direct and indirect effects on migratory bird and raptor species are discussed further in Section 3.2.4.6.

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the B2H Project would have long-term moderate residual impacts on migratory birds and raptors from removal or disturbance to nesting sites and potential mortality (with no population-level effect).

The cumulative effects on vegetation community types used as habitat by migratory birds are compared by alternative route in Table 3-712 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for migratory birds are presented in Table 3-711 in Section 3.3.3.3. Collision mortality is caused in the greatest numbers by window strikes, but energy facilities such as transmission and distribution lines and wind turbines are a substantial proportion of annual collision mortality as well. Wind energy in particular causes a high risk of collision to some long-lived species sensitive to additional mortality, such as the golden eagle and other raptors (Drewitt and Langston 2008). Existing and future communication towers, transmission and distribution lines, and wind-energy projects will continue to increase the collision mortality risk for migratory birds in the CIAA.

Wildfires and military activities on the NWSTF Boardman also could add to the cumulative impact on migratory birds along the Applicant's Proposed Action Alternative, Applicant's Proposed Action – Southern Route, and West of Bombing Range Road – Southern Route. More than 85 percent of the NWSTF Boardman has been burned by wildfires since 1998 (Navy 2015). Wildfires historically occur on the NWSTF Boardman at approximate 20- to 50-year intervals, but now occur at greater frequency and intensity with the increase of fuel from the spread of cheatgrass and other non-native annual grasses. The influx of wildfire has caused short- and long-term alterations to migratory bird habitat on the Boardman Grasslands Important Bird Areas on the NWSTF Boardman, including decreased nesting and foraging habitat (Navy 2012). Impacts from current military activities on the NWSTF Boardman include noise disturbance from aircraft overflight, small arms firing, non-explosive practice munitions striking a target or the ground, and vehicle and equipment operations, as well as habitat degradation from vegetation removal for firebreak maintenance (Navy 2015).

Approved military activities on NWSTF Boardman would result in loss and degradation of migratory bird habitat. Habitat loss would occur from permanent development of habitat for proposed military facilities (Navy 2015). Long-term habitat degradation would result from new ground disturbance, as well as an increase in noise, visual disturbance, human activity, and wildfire risk (Navy 2015). In particular, disturbance from construction activities during nesting season would diminish reproductive success. Additionally, an increase in incidental mortality could occur from aircraft strikes (Navy 2015). Protective measures were developed by the Navy to minimize impacts on migratory birds (2015).

All alternative routes would contribute to the cumulative loss and modification of migratory bird habitat resulting from the past and present actions and RFFAs in the CIAA. Migratory bird habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on migratory bird habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Big Game

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on mule deer and elk winter range. The direct effects from the B2H Project on mule deer and elk winter range would include vehicle collisions, habitat loss, and noise and visual disturbance. Indirect effects from the

B2H Project would include fugitive dust, increased human activity along the right-of-way and project roads, and habitat alteration.

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the B2H Project would have short-term low residual impacts on big game habitat from impacts that would have only minor adverse effects on habitat and that would not limit the long-term sustainability of populations (Refer to map MV-10 and Table 3-148). Types of potential direct and indirect effects on migratory bird and raptor species are discussed further in Section 3.2.4.6. Big game habitat is discussed further in Section 3.2.4.6.

Past and present actions in the CIAA that have likely affected big game habitat include:

- Aggregate/mineral mining
- Communication towers
- Residential, recreational, and commercial development
- Dams
- Pipelines
- Roads
- Wind-energy facilities
- Transmission lines
- Railroads
- Wildfire
- Vegetation management

RFFAs in the CIAA for big game habitat for the B2H Project include:

- Wind-energy facilities (Wheatridge Wind Turbines and Buttercreek Wind Turbines)
- Oil and gas development
- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-724.

Table 3-724. Cumulative Effects Summary for Big Game in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Elk Winter Range							
Applicant's Proposed Action	1,105,217	17,157	0	296	17,453	1,087,764	1.7
Variation S1-B1	*655,092*	*11,227*	*0*	*15*	*11,242*	*643,850*	*0.1*
Variation S1-B2	*655,092*	*11,227*	*0*	*22*	*11,249*	*643,842*	*0.2*
East of Bombing Range Road	1,105,217	17,157	0	296	17,453	1,087,765	1.7
Applicant's Proposed Action – Southern Route	1,105,217	17,157	0	413	17,569	1,087,648	2.4
West of Bombing Range Road – Southern Route	1,105,217	17,157	0	432	17,589	1,087,628	2.5
Longhorn	1,105,217	17,157	0	302	17,459	1,087,758	1.7
Interstate 84	1,105,217	17,157	0	301	17,457	1,087,760	1.7
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	1,105,217	17,157	0	417	17,574	1,087,644	2.4
Mule Deer Winter Range							
Applicant's Proposed Action	2,473,417	38,877	4,605	189	43,671	2,429,746	0.4
Variation S1-B1	*1,780,495*	*29,400*	*0*	*10*	*29,410*	*1,751,085*	*<0.1*
Variation S1-B2	*1,780,495*	*29,400*	*0*	*8*	*29,408*	*1,751,087*	*<0.1*
East of Bombing Range Road	2,473,417	38,877	4,605	189	43,671	2,429,746	0.4
Applicant's Proposed Action – Southern Route	2,473,417	38,877	4,605	420	43,903	2,429,515	1.0
West of Bombing Range Road – Southern Route	2,473,417	38,877	4,605	1,023	44,505	2,428,913	2.3
Longhorn	2,473,417	38,877	4,605	193	43,675	2,429,742	0.4
Interstate 84	2,473,417	38,877	4,605	192	43,674	2,429,743	0.4
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	2,473,417	38,877	4,605	425	43,907	2,429,511	1.0

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

All alternative routes would contribute to the cumulative loss and modification of elk and mule deer winter range resulting from the past and present actions and RFFAs in the CIAA. Under all alternative

routes, the majority of big game habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, big game habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions (refer to Table 3-724).

Segment 2—Blue Mountains

Wildlife Habitat

Direct, indirect, and cumulative effects on wildlife habitat are the same as direct, indirect, and cumulative effects on the vegetation communities discussed in Section 3.2.3 and the vegetation section above (Section 3.3.3.3), and are not discussed separately here.

Special Status Species

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for special status species. The amount of disturbance of vegetation community types used as habitat by special status species are compared by alternative route in Table 3-123 in Section 3.2.3. Refer to Table 3-142 in Section 3.2.4.5 for a list of special status species in the B2H Project area.

The types of potential direct and indirect effects and levels of residual impacts from the B2H Project on special status species in Segment 2 would the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by special status species are compared by alternative route in Table 3-714 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for special status wildlife are presented in Table 3-713 in Section 3.3.3.3. Collision risk for bird species in the CIAA is discussed under Migratory Birds Including Raptors.

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of special status species habitat resulting from the past and present actions and RFFAs in the CIAA. Special status species habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on special status species habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Greater Sage-Grouse

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Greater Sage-Grouse. Potential direct effects on Greater Sage-Grouse from construction, operation, and maintenance of transmission lines the B2H Project include mortality due to electrocution; collisions with construction and maintenance vehicles; fragmentation of habitats due to the introduction of tall structures, increased EMFs, and construction of new roads; loss and degradation of habitat quality and function; disturbance to breeding activities due to increased human presence and noise at lek locations; disturbance to sensitive periods resulting from human presence, vehicle use, and noise during construction and maintenance; and interruption and/or alteration of seasonal

migrations and movements among populations. Potential indirect effects on Greater Sage-Grouse from construction, operation, and maintenance of the B2H Project include alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds; avoidance of habitat due to potential increase in raptor predation pressure; disruption of nesting and breeding activities and avoidance of habitat due to vehicle noise and human presence resulting from public use of new access roads; increased mammalian predation risk; increased raptor and raven predation risk; and alteration of behavioral patterns due to increased predation pressure.

Direct and indirect impacts on Greater Sage-Grouse GHMA would be expected on a small amount of GHMA from the Applicant's Proposed Action Alternative, Glass Hill Alternative, Mill Creek Alternative, Variation S2-F1, and Variation S2-F2 (Table 3-176). No leks would be anticipated to be directly or indirectly affected. In addition, indirect effects (but no direct effects) on PHMA would be expected (refer to Section 3.2.4.6 for analysis of indirect effects on Greater Sage-Grouse habitat).

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139 in Section 3.2.4.4) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the B2H Project would have long-term moderate residual impacts from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability (Refer to map MV-9 and Table 3-149). Types of potential direct and indirect effects on Greater Sage-Grouse are discussed further in Section 3.2.4.6.

Past and present actions in the CIAA that have likely affected Greater Sage-Grouse habitat include:

- Aggregate/mineral mining
- Communication towers
- Roads
- Wind-energy facilities
- Transmission lines
- Railroads

No RFFAs in the CIAA for Greater Sage-Grouse habitat are known.

A summary of the cumulative effects analysis for Greater Sage-Grouse GHMA is presented in Table 3-725. The cumulative effects analysis results for Greater Sage-Grouse PHMA are not displayed, as the B2H Project in Segment 2 would not contribute to the cumulative effects on PHMA.

Table 3-725. Cumulative Effects Summary for Greater Sage-Grouse General Habitat Management Areas in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	42,221	506	0	69	574	41,647	12.0
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-C1	*7,312*	*48*	*0*	*0*	*48*	*7,263*	*None*
Variation S2-C2	*7,312*	*48*	*0*	*0*	*48*	*7,263*	*None*
Variation S2-E1	*19,135*	*195*	*0*	*0*	*195*	*18,940*	*None*
Variation S2-E2	*19,135*	*195*	*0*	*0*	*195*	*18,940*	*None*
Variation S2-F1	*42,221*	*506*	*0*	*65*	*571*	*41,651*	*11.4*
Variation S2-F2	*42,247*	*506*	*0*	*41*	*547*	*41,700*	*7.6*
Glass Hill	42,221	506	0	68	573	41,648	11.8
Variation S2-D1	*2,090*	*14*	*0*	*0*	*14*	*2,077*	*None*
Variation S2-D2	*2,090*	*14*	*0*	*0*	*14*	*2,077*	*None*
Mill Creek	42,247	506	0	44	549	41,698	8.0

Table Notes:
Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.
The cumulative effects analysis results for Greater Sage-Grouse Priority Habitat Management Areas are not displayed, as the B2H Project in Segment 2 would not contribute to the cumulative effects on Priority Habitat Management Areas.

The Proposed Action, Glass Hill Alternative, Mill Creek Alternative, Variation S2-F1, and Variation S2-F2 would contribute to the cumulative loss, fragmentation, and modification of Greater Sage-Grouse GHMA resulting from the past and present actions and RFFAs in the CIAA.

The majority of Greater Sage-Grouse habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Greater Sage-Grouse habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Portions of the Proposed Action and the Glass Hill Alternative, and all of the Mill Creek Variation and Variation S2-F2, parallel an existing high-voltage transmission line in or near Greater Sage-Grouse habitat that that has degraded the existing quality of Greater Sage-Grouse habitats. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Migratory Birds Including Raptors

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for migratory birds and raptors. The amount of disturbance of vegetation community types used as habitat by migratory bird and raptor species are compared by alternative route in Table 3-123. Migratory bird habitats that would be disturbed, species that may be affected, and known bald and golden eagle nest occurrences are described in Section 3.2.4.5.

The types of potential direct and indirect effects and levels of residual impacts from the B2H Project on migratory birds and raptors in Segment 2 would be the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by migratory birds are compared by alternative route in Table 3-714 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for migratory birds are presented in Table 3-713 in Section 3.3.3.3. Migratory bird collision mortality is caused in the greatest numbers by window strikes, but energy facilities such as transmission and distribution lines and wind turbines are a substantial proportion of annual collision mortality, as well. Wind energy in particular causes a high risk of collision to some long-lived species sensitive to additional mortality, such as the golden eagle and other raptors (Drewitt and Langston 2008). Existing and future communication towers, transmission and distribution lines, and wind-energy projects will continue to increase the collision mortality risk for migratory birds in the CIAA.

All alternative routes and route variations would contribute to the cumulative loss and modification of migratory bird habitat resulting from the past and present actions and RFFAs in the CIAA. Migratory bird habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on migratory bird habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Big Game

The potential direct and indirect effects from the B2H Project would contribute to the cumulative effects on mule deer and elk winter range. The potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 2 would be the same as those described for Segment 1.

Past and present actions in the CIAA that have likely affected big game habitat include:

- Aggregate/mineral mining
- Communication towers
- Residential, recreational, and commercial development
- Power substations
- Dams
- Pipelines
- Roads
- Wind-energy facilities

- Transmission lines
- Railroads
- Wildfire
- Vegetation management

RFFAs in the CIAA for big game habitat for the B2H Project include:

- Wind-energy facilities (Wheatridge Wind Turbines)
- Oil and gas development
- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-726.

Table 3-726. Cumulative Effects Summary for Big Game in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Elk Winter Range							
Applicant's Proposed Action	655,092	11,227	0	650	11,877	643,215	5.5
Variation S2-A1	*655,092*	*11,227*	*0*	*59*	*11,286*	*643,806*	*0.5*
Variation S2-A2	*655,092*	*11,227*	*0*	*60*	*11,287*	*643,805*	*0.5*
Variation S2-B1	*655,092*	*11,227*	*0*	*83*	*11,310*	*643,782*	*0.7*
Variation S2-B2	*655,092*	*11,227*	*0*	*84*	*11,311*	*643,781*	*0.7*
Variation S2-C1	*655,092*	*11,227*	*0*	*177*	*11,404*	*643,688*	*1.6*
Variation S2-C2	*655,092*	*11,227*	*0*	*145*	*11,372*	*643,719*	*1.3*
Variation S2-E1	*655,092*	*11,227*	*0*	*51*	*11,278*	*643,814*	*0.5*
Variation S2-E2	*655,092*	*11,227*	*0*	*59*	*11,285*	*643,806*	*0.5*
Variation S2-F1	*655,092*	*11,227*	*0*	*199*	*11,425*	*643,666*	*1.7*
Variation S2-F2	*655,092*	*11,227*	*0*	*220*	*11,446*	*643,645*	*1.9*
Glass Hill	655,092	11,227	0	641	11,868	643,224	5.4
Variation S2-D1	*655,092*	*11,227*	*0*	*109*	*11,336*	*643,755*	*1.0*
Variation S2-D2	*655,092*	*11,227*	*0*	*98*	*11,325*	*643,767*	*0.9*
Mill Creek	655,092	11,227	0	725	11,952	643,140	6.1
Mule Deer Winter Range							
Applicant's Proposed Action	1,780,495	29,400	0	59	29,460	1,751,035	0.2
Variation S2-A1	*1,780,495*	*29,400*	*0*	*60*	*29,460*	*1,751,035*	*0.2*
Variation S2-A2	*1,780,495*	*29,400*	*0*	*83*	*29,484*	*1,751,011*	*0.3*
Variation S2-B1	*1,780,495*	*29,400*	*0*	*84*	*29,484*	*1,751,011*	*0.3*
Variation S2-B2	*1,780,495*	*29,400*	*0*	*120*	*29,520*	*1,750,975*	*0.4*

Table 3-726. Cumulative Effects Summary for Big Game in Segment 2—Blue Mountains in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S2-C1	*1,780,495*	*29,400*	*0*	*119*	*29,519*	*1,750,976*	*0.4*
Variation S2-C2	*1,780,495*	*29,400*	*0*	*51*	*29,451*	*1,751,044*	*0.2*
Variation S2-E1	*1,780,495*	*29,400*	*0*	*59*	*29,459*	*1,751,036*	*0.2*
Variation S2-E2	*1,780,495*	*29,400*	*0*	*199*	*29,599*	*1,750,896*	*0.7*
Variation S2-F1	*1,780,495*	*29,400*	*0*	*220*	*29,620*	*1,750,875*	*0.7*
Variation S2-F2	*1,780,495*	*29,400*	*0*	*587*	*29,988*	*1,750,507*	*2.0*
Glass Hill	1,780,495	29,400	0	72	29,472	1,751,023	0.2
Variation S2-D1	*1,780,495*	*29,400*	*0*	*52*	*29,453*	*1,751,042*	*0.2*
Variation S2-D2	*1,780,495*	*29,400*	*0*	*725*	*30,126*	*1,750,369*	*2.4*
Mill Creek	12,456	320	0	20	340	12,116	5.8
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

All alternative routes would contribute to the cumulative loss and modification of elk and mule deer winter range resulting from the past and present actions and RFFAs in the CIAA. Under all alternative routes, the majority of big game habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, big game habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Segment 3—Baker Valley

Wildlife Habitat

Direct, indirect, and cumulative effects on wildlife habitat are the same as direct, indirect, and cumulative effects on the vegetation communities discussed in Section 3.2.3 and the vegetation section above (Section 3.3.3.3), and are not discussed separately here.

Special Status Species

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for special status species. The amount of disturbance of vegetation community types used as habitat by special status species are compared by alternative route in Table 3-127 in Section 3.2.3. Refer to Table 3-142 in Section 3.2.4.5 for a list of special status species in the B2H Project area.

The types of potential direct and indirect effects, and levels of residual impacts, from the B2H Project on special status species in Segment 3 would be the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by special status species are compared by alternative route in Table 3-716 in Section 3.3.3.3. Past and present actions and RFFAs

in the CIAA that have likely affected vegetation communities that provide habitat for special status wildlife are presented in Table 3-715 in Section 3.3.3.3. Collision risk for bird species in the CIAA is discussed under Migratory Birds Including Raptors.

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of special status species habitat resulting from the past and present actions and RFFAs in the CIAA. Special status species habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on special status species habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Greater Sage-Grouse

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Greater Sage-Grouse. The potential direct and indirect effects from the B2H Project in Segment 3 would be similar to those described for Segment 2 and are discussed in detail in Section 3.2.4.5. Direct and indirect impacts would be expected on Greater Sage-Grouse GHMA from all alternative routes and route variations; direct and indirect impacts on PHMA would be expected from all routes except for the Timber Canyon Alternative and Variations S3-C3, S3-C4, S3-C5, and S3-C6, from which only indirect effects would be anticipated (refer to Table 3-177 and the analysis of indirect effects on Greater Sage-Grouse habitat in Section 3.2.4.6).

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139 in Section 3.2.4.4) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the B2H Project would have long-term moderate residual impacts from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability; the alternative routes and route variations (excluding the Timber Canyon Alternative and Variations S3-C3, S3-C4, S3-C5, and S3-C6) would have long-term high residual impacts from permanent loss of PHMA that results in population-level effects (MV-9 and Table 3-176). Types of potential direct and indirect effects on Greater Sage-Grouse are discussed further in Section 3.2.4.6.

Past and present actions in the CIAA that have likely affected Greater Sage-Grouse habitat include:

- Aggregate/mineral mining
- Communication towers
- Residential, recreational, and commercial development
- Roads
- Pipelines
- Dams
- Wind-energy facilities
- Transmission lines
- Railroads

- Wildfires
- Vegetation management

RFFAs in the CIAA for Greater Sage-Grouse habitat for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining

A summary of the cumulative effects analysis is presented in Table 3-727.

Table 3-727. Cumulative Effects Summary for Greater Sage-Grouse in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
General Habitat Management Areas							
Applicant's Proposed Action	191,148	1,739	0	378	2,117	189,031	17.8
Variation S3-A1	45,530	520	0	90	610	44,921	14.7
Variation S3-A2	45,548	519	0	65	584	44,963	11.1
Variation S3-B1	20,926	415	0	8	423	20,503	1.9
Variation S3-B2	19,750	408	0	76	484	19,267	15.7
Variation S3-B3	19,750	408	0	38	445	19,305	8.4
Variation S3-B4	19,750	408	0	23	430	19,320	5.3
Variation S3-B5	19,750	408	0	89	496	19,254	17.9
Variation S3-C1	145,745	1,221	0	122	1,342	144,403	9.1
Variation S3-C2	145,752	1,221	0	130	1,350	144,401	9.6
Variation S3-C3	130,533	1,199	0	24	1,224	129,310	2.0
Variation S3-C4	130,991	1,204	0	24	1,228	129,763	2.0
Variation S3-C5	125,666	1,180	0	27	1,207	124,458	2.2
Variation S3-C6	123,359	1,182	0	257	1,439	121,920	17.8
Flagstaff A	189,973	1,731	0	458	2,189	187,783	20.9
Timber Canyon	214,961	1,656	0	685	2,341	212,621	29.2
Flagstaff A – Burnt River Mountain	174,761	1,710	0	370	2,081	172,680	17.8
Flagstaff B	189,973	1,731	0	404	2,135	187,837	18.9
Flagstaff B – Burnt River West	169,910	1,690	0	305	1,995	167,915	15.3
Flagstaff B – Durkee	167,586	1,693	0	535	2,228	165,358	24.0

Table 3-727. Cumulative Effects Summary for Greater Sage-Grouse in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Priority Habitat Management Areas							
Applicant's Proposed Action	321,512	3,607	0	670	4,277	317,235	15.7
Variation S3-A1	*144,651*	*2,189*	*0*	*166*	*2,355*	*142,296*	*7.1*
Variation S3-A2	*144,886*	*2,190*	*0*	*185*	*2,375*	*142,511*	*7.8*
Variation S3-B1	*195,434*	*2,713*	*0*	*298*	*3,011*	*192,423*	*9.9*
Variation S3-B2	*178,743*	*2,475*	*0*	*88*	*2,563*	*176,179*	*3.4*
Variation S3-B3	*178,743*	*2,475*	*0*	*86*	*2,561*	*176,182*	*3.3*
Variation S3-B4	*177,662*	*2,440*	*0*	*49*	*2,488*	*175,173*	*2.0*
Variation S3-B5	*177,473*	*2,433*	*0*	*49*	*2,483*	*174,990*	*2.0*
Variation S3-C1	*187,442*	*1,346*	*0*	*205*	*1,551*	*185,891*	*13.2*
Variation S3-C2	*186,841*	*1,344*	*0*	*200*	*1,544*	*185,296*	*13.0*
Variation S3-C3	*188,612*	*1,359*	*0*	*0*	*1,359*	*187,253*	*None*
Variation S3-C4	*189,175*	*1,359*	*0*	*0*	*1,359*	*187,816*	*None*
Variation S3-C5	*199,652*	*1,430*	*0*	*0*	*1,430*	*198,222*	*None*
Variation S3-C6	*242,625*	*1,744*	*0*	*0*	*1,744*	*240,881*	*None*
Flagstaff A	310,233	3,365	0	418	3,783	306,450	11.1
Timber Canyon	309,721	3,533	0	0	3,533	306,188	None
Flagstaff A – Burnt River Mountain	311,490	3,378	0	230	3,608	307,882	6.4
Flagstaff B	310,853	3,401	0	455	3,856	306,997	11.8
Flagstaff B – Burnt River West	323,379	3,487	0	305	3,791	319,588	8.0
Flagstaff B – Durkee	366,123	3,799	0	286	4,085	362,038	7.0

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of Greater Sage-Grouse GHMA resulting from the past and present actions and RFFAs in the CIAA; all routes except for the Timber Canyon Alternative and Variations S3-C3, S3-C4, S3-C5, and S3-C6 would contribute to the cumulative effects on Greater Sage-Grouse PHMA.

Numerous large wildfires have affected areas of Greater Sage-Grouse habitat in the CIAA in Segment 3. Large wildfires in Greater Sage-Grouse habitat in proximity to the B2H Project have primarily occurred on southwest portions of the Baker Oregon PAC and the adjacent GHMA, and include the 1,485-acre White Swan Fire (2001), the 4,402-acre Iron Mountain Fire (2006), 2,904-acre Pleasant

Valley Fire (2007), the 3,300 Radio Tower Fire (2014), the 103,865-acre Cornet-Windy Ridge Fire (2015), and the 12,024-acre Lime Hill Fire (2015) (BLM n.d.; USGS 2016). The White Swan Fire and the Radio Tower Fire burned PHMA on the Baker Oregon PAC that is only crossed by the Applicant's Proposed Action Alternative. The Radio Tower Fire also burned GHMA crossed by the Applicant's Proposed Alternative, Flagstaff A, Flagstaff A – Burnt River Mountain, Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee. The Pleasant Valley Fire burned PHMA and GHMA in proximity to the Applicant's Proposed Alternative, Flagstaff A, Flagstaff A – Burnt River Mountain, Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee. The Cornet-Windy Ridge Fire burned only relatively small areas of GHMA in proximity to the Applicant's Proposed Alternative, Flagstaff A, Flagstaff A – Burnt River Mountain, Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee, and the northern end of Variations S3-1, S3-2, S3-3, S3-4, S3-5, and S3-6. The Iron Mountain Fire occurred in the Baker Oregon PAC in proximity to the Applicant's Proposed Alternative, Flagstaff A, Flagstaff A – Burnt River Mountain, Flagstaff B, Flagstaff B – Burnt River West, and Flagstaff B – Durkee, and the northern end of Variations S3-1, S3-2, S3-3, S3-4, S3-5, and S3-6. Additionally, the Lime Hill Fire burned PHMA and GHMA just south of the Segment 3 alternative routes in the Segment 4 study corridor and is discussed further in the Segment 4 cumulative effects analysis.

Fires in Greater Sage-Grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of Greater Sage-Grouse habitats.

The majority of Greater Sage-Grouse habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Greater Sage-Grouse habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Portions of the routes parallel existing high-voltage transmission lines that have degraded the existing quality of Greater Sage-Grouse habitats. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Migratory Birds Including Raptors

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for raptors and other migratory birds. The amount of disturbance to vegetation community types used as habitat by migratory birds is compared by alternative route in Table 3-127. Migratory bird habitats that would be disturbed, species that may be affected, and known bald and golden eagle nest occurrences are described in Section 3.2.4.5.

The types of potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 3 would be the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by migratory birds are compared by alternative route in Table 3-716 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for migratory birds are presented in Table 3-715 in Section 3.3.3.3.

Migratory bird collision mortality is caused in the greatest numbers by window strikes, but energy facilities such as transmission and distribution lines and wind turbines are a substantial proportion of annual collision mortality, as well. Wind energy in particular causes a high risk of collision to some long-lived species sensitive to additional mortality, such as the golden eagle and other raptors (Drewitt and Langston 2008). Existing and future communication towers, transmission and distribution lines, and wind-energy projects will continue to increase the collision mortality risk for migratory birds in the CIAA.

All alternative routes and route variations would contribute to the cumulative loss and modification of migratory bird habitat resulting from the past and present actions and RFFAs in the CIAA. Migratory bird habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on migratory bird habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Big Game

The potential direct and indirect effects from the B2H Project would contribute to the cumulative effects on mule deer and elk winter range, as well as bighorn sheep Oregon occupied range. The potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 3 would be the same as those described for Segment 1.

Past and present actions in the CIAA that have likely affected big game habitat include:

- Aggregate/mineral mining
- Communication towers
- Fiber optic lines
- Residential, recreational, and commercial development
- Power substations
- Dams
- Pipelines
- Roads
- Wind-energy facilities
- Transmission lines
- Railroads
- Wildfires
- Vegetation management

RFFAs in the CIAA for big game habitat for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-728.

Table 3-728. Cumulative Effects Summary for Big Game in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Elk Winter Range							
Applicant's Proposed Action	658,743	5,430	0	7	5,437	653,306	0.1
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-C1	*658,743*	*5,430*	*0*	*7*	*5,438*	*653,305*	*0.1*
Variation S3-C2	*658,743*	*5,430*	*0*	*7*	*5,438*	*653,305*	*0.1*
Variation S3-C3	*658,743*	*5,430*	*0*	*78*	*5,509*	*653,234*	*1.4*
Variation S3-C4	*658,743*	*5,430*	*0*	*79*	*5,509*	*653,234*	*1.4*
Variation S3-C5	*658,743*	*5,430*	*0*	*274*	*5,704*	*653,039*	*4.8*
Variation S3-C6	*721,938*	*6,113*	*0*	*471*	*6,585*	*715,353*	*7.2*
Flagstaff A	658,743	5,430	0	7	5,437	653,306	0.1
Timber Canyon	1,458,492	17,321	0	998	18,319	1,440,173	5.4
Flagstaff A – Burnt River Mountain	658,743	5,430	0	72	5,502	653,240	1.3
Flagstaff B	658,743	5,430	0	7	5,437	653,306	0.1
Flagstaff B – Burnt River West	658,743	5,430	0	234	5,664	653,079	4.1
Flagstaff B - Durkee	721,938	6,113	0	405	6,518	715,420	6.2
Mule Deer Winter Range							
Applicant's Proposed Action	1,780,495	29,400	0	492	29,893	1,750,602	1.6
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B1	*1,780,495*	*29,400*	*0*	*17*	*29,417*	*1,751,078*	*<0.1*
Variation S3-B2	*1,780,495*	*29,400*	*0*	*94*	*29,494*	*1,751,001*	*0.3*
Variation S3-B3	*1,780,495*	*29,400*	*0*	*95*	*29,495*	*1,751,000*	*0.3*
Variation S3-B4	*1,780,495*	*29,400*	*0*	*94*	*29,494*	*1,751,001*	*0.3*
Variation S3-B5	*1,780,495*	*29,400*	*0*	*92*	*29,493*	*1,751,002*	*0.3*
Variation S3-C1	*1,780,495*	*29,400*	*0*	*323*	*29,724*	*1,750,771*	*1.1*
Variation S3-C2	*1,780,495*	*29,400*	*0*	*342*	*29,742*	*1,750,753*	*1.1*
Variation S3-C3	*1,780,495*	*29,400*	*0*	*394*	*29,795*	*1,750,700*	*1.3*
Variation S3-C4	*1,780,495*	*29,400*	*0*	*402*	*29,802*	*1,750,693*	*1.3*
Variation S3-C5	*1,780,495*	*29,400*	*0*	*568*	*29,969*	*1,750,526*	*1.9*
Variation S3-C6	*1,780,495*	*29,400*	*0*	*677*	*30,078*	*1,750,417*	*2.3*

Table 3-728. Cumulative Effects Summary for Big Game in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Flagstaff A	1,780,495	29,400	0	566	29,967	1,750,528	1.9
Timber Canyon	1,780,495	29,400	0	792	30,192	1,750,303	2.6
Flagstaff A – Burnt River Mountain	1,780,495	29,400	0	630	30,030	1,750,465	2.1
Flagstaff B	1,780,495	29,400	0	568	29,968	1,750,527	1.9
Flagstaff B – Burnt River West	1,780,495	29,400	0	769	30,169	1,750,326	2.5
Flagstaff B - Durkee	1,780,495	29,400	0	871	30,271	1,750,224	2.9
Bighorn Sheep Oregon Occupied Range							
Applicant's Proposed Action	0	0	0	0	0	0	None
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-C1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-C2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-C3	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S3-C4	*32,950*	*209*	*0*	*0*	*209*	*32,741*	*0.2*
Variation S3-C5	*32,950*	*209*	*0*	*22*	*231*	*32,719*	*9.7*
Variation S3-C6	*32,950*	*209*	*0*	*37*	*246*	*32,704*	*15.1*
Flagstaff A	0	0	0	0	0	0	None
Timber Canyon	0	0	0	0	0	0	None
Flagstaff A – Burnt River Mountain	0	0	0	0	0	0	None
Flagstaff B	0	0	0	0	0	0	None
Flagstaff B – Burnt River West	32,950	209	0	19	228	32,722	8.4
Flagstaff B - Durkee	32,950	209	0	32	241	32,710	13.3

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

All alternative routes and route variations, except for Variations S3-A1 and S3-A2, would contribute to the cumulative loss and modification of mule deer winter range; all alternative routes and route variations, except for Variations S3-A1, S3-A2, S3-B1, S3-B2, S3-B3, S3-B4, and S3-B5 would contribute to the cumulative effects on elk winter range; and only the Flagstaff B – Burnt River West Alternative, Flagstaff B – Durkee Alternative, and Variations S3-C4, S3-C5, and S3-C6 would contribute

to the cumulative loss and modification of bighorn sheep habitat. Under all alternative routes and route variations, the majority of big game habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, big game habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Segment 4—Brogan

Wildlife Habitat

Direct, indirect, and cumulative effects on wildlife habitat are the same as direct, indirect, and cumulative effects on the vegetation communities discussed in Section 3.2.3 and the vegetation section above (Section 3.3.3.3), and are not discussed separately here.

Special Status Species

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for special status species. The amount of disturbance of vegetation community types used as habitat by special status species are compared by alternative route in Table 3-131 in Section 3.2.3. Refer to Table 3-142 in Section 3.2.4.5 for a list of special status species in the B2H Project area.

The types of potential direct and indirect effects, and levels of residual impacts, from the B2H Project on special status species in Segment 4 would be the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by special status species are compared by alternative route inTable 3-718 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for special status wildlife are presented in Table 3-719 in Section 3.3.3.3. Collision risk for bird species in the CIAA is discussed under Migratory Birds Including Raptors.

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of special status species habitat resulting from the past and present actions and RFFAs in the CIAA. Special status species habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on special status species habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Greater Sage-Grouse

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Greater Sage-Grouse. The potential direct and indirect effects from the B2H Project in Segment 4 would be similar to those described for Segment 3. Direct and indirect impacts would be expected on Greater Sage-Grouse GHMA from all alternative routes and route variations; direct and indirect impacts on PHMA would be expected from all routes except for Variations S4-A1, S4-A2, and S4-A3, from which only indirect effects would be anticipated (refer to Table 3-181) and the analysis of indirect effects on Greater Sage-Grouse habitat in Section 3.2.4.6). Types of potential direct and indirect effects on Greater Sage-Grouse are discussed further in Section 3.2.4.6.

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) and the criteria for duration of impacts described under Methodology in Section 3.2.4.6, the alternative routes and route variations would have long-term moderate residual impacts from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability; the routes (except for Variations S4-A1, S4-A2, and S4-A3) would have long-term high residual impacts from permanent loss of PHMA that results in population-level effects (MV-9 and Table 3-180).

Past and present actions in the CIAA that have likely affected Greater Sage-Grouse habitat include:

- Aggregate/mineral mining
- Fiber optic lines
- Communication towers
- Residential, recreational, and commercial development
- Roads
- Pipelines
- Dams
- Transmission lines
- Railroads
- Wildfires
- Vegetation management

RFFAs in the CIAA for Greater Sage-Grouse habitat for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining

A summary of the cumulative effects analysis is presented in Table 3-729.

Table 3-729. Cumulative Effects Summary for Greater Sage-Grouse in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
General Habitat Management Areas							
Applicant's Proposed Action	268,972	1,813	0	444	2,257	266,716	19.7
Variation S4-A1	118,813	818	0	125	943	117,869	13.2
Variation S4-A2	119,197	819	0	117	936	118,261	12.5
Variation S4-A3	118,544	817	0	118	935	117,610	12.6
Tub Mountain South	238,585	1,648	0	222	1,870	236,715	11.9
Willow Creek	249,692	1,737	0	323	2,060	247,632	15.7

Table 3-729. Cumulative Effects Summary for Greater Sage-Grouse in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Priority Habitat Management Areas							
Applicant's Proposed Action	261,541	2,208	0	483	2,691	258,851	17.9
Variation S4-A1	*102,471*	*628*	*0*	*0*	*628*	*101,842*	*None*
Variation S4-A2	*101,632*	*622*	*0*	*0*	*622*	*101,010*	*None*
Variation S4-A3	*101,802*	*624*	*0*	*0*	*624*	*101,178*	*None*
Tub Mountain South	121,409	763	0	149	913	120,497	16.4
Willow Creek	169,612	1,369	0	346	1,715	167,897	20.2

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of Greater Sage-Grouse GHMA resulting from the past and present actions and RFFAs in the CIAA; all routes except for Variations S4-A1, S4-A2, and S4-A3 would contribute to the cumulative effects on Greater Sage-Grouse PHMA.

Numerous large wildfires have affected areas of Greater Sage-Grouse habitat in the CIAA in Segment 4 (BLM n.d.; USGS 2016). The 80,054-acre Jackson Fire (2000) occurred on PHMA on the Cow Valley PAC and GHMA in proximity to central portions of the Willow Creek and Tub Mountain South Alternatives. The 4,104-acre Cavanaugh 2 Fire (2001) burned GHMA crossed by all alternative routes and route variations near the north end of Segment 4. The 4,302-acre Farewell Bend Fire (2005) burned PHMA on northeast portions of the Cow Valley PAC crossed by the Applicant's Proposed Action Alternative and Willow Creek Alternative. The 14,632-acre Mud Springs Fire (2006) burned PHMA on southwest portions of the Cow Valley PAC in proximity to the Willow Creek Alternative. The 22,700-acre Kitten Fire Complex (2014) occurred on PHMA on east-central portions of the Cow Valley PAC crossed by the Applicant's Proposed Action Alternative. The 12,024-acre Lime Hill Fire (2015) occurred on PHMA on northeast portions of the Cow Valley PAC, as well as GHMA near the north end of Segment 4, crossed by the Applicant's Proposed Action Alternative, Willow Creek Alternative, and the Tub Mountain South Alternative (BLM n.d.; USGS 2016).

Fires in Greater Sage-Grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of Greater Sage-Grouse habitats.

The majority of Greater Sage-Grouse habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Greater Sage-Grouse habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Portions of the routes parallel existing high-voltage transmission lines that have degraded the existing quality of Greater Sage-Grouse habitats. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Migratory Birds Including Raptors

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for raptors and other migratory birds. The amount of disturbance to vegetation community types used as habitat by migratory birds is compared by alternative route in Table 3-131. Migratory bird habitats that would be disturbed, species that may be affected, and known bald and golden eagle nest occurrences are described in Section 3.2.4.5.

The types of potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 4 would be the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by migratory birds are compared by alternative route in Table 3-718 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for migratory birds are presented in Table 3-717 in Section 3.3.3.3. Migratory bird collision mortality is caused in the greatest numbers by window strikes, but energy facilities such as transmission and distribution lines and wind turbines are a substantial proportion of annual collision mortality, as well. Wind energy in particular causes a high risk of collision to some long-lived species sensitive to additional mortality, such as the golden eagle and other raptors (Drewitt and Langston 2008). Existing and future communication towers, transmission and distribution lines, and wind-energy projects will continue to increase the collision mortality risk for migratory birds in the CIAA.

All alternative routes and route variations would contribute to the cumulative loss and modification of migratory bird habitat resulting from the past and present actions and RFFAs in the CIAA. Migratory bird habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on migratory bird habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Big Game

The potential direct and indirect effects from the B2H Project would contribute to the cumulative effects on mule deer, pronghorn, and elk winter range. The types of potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 4 would be similar to those described for Segment 1.

Past and present actions in the CIAA that have likely affected big game habitat include:

- Aggregate/mineral mining
- Communication towers
- Fiber optic lines

- Residential, recreational, and commercial development
- Power substations
- Dams
- Pipelines
- Roads
- Transmission lines
- Railroads
- Wildfires
- Vegetation management

RFFAs in the CIAA for big game habitat for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-730.

Table 3-730. Cumulative Effects Summary for Big Game in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Elk Winter Range							
Applicant's Proposed Action	658,743	5,430	0	841	6,272	652,471	13.4
Variation S4-A1	*658,743*	*5,430*	*0*	*154*	*5,584*	*653,159*	*2.8*
Variation S4-A2	*658,743*	*5,430*	*0*	*145*	*5,576*	*653,167*	*2.6*
Variation S4-A3	*658,743*	*5,430*	*0*	*148*	*5,579*	*653,164*	*2.7*
Tub Mountain South	658,743	5,430	0	529	5,959	652,783	8.9
Willow Creek	658,743	5,430	0	572	6,003	652,740	9.5
Mule Deer Winter Range							
Applicant's Proposed Action	1,780,495	29,400	0	619	30,019	1,750,476	2.1
Variation S4-A1	*1,780,495*	*29,400*	*0*	*154*	*29,554*	*1,750,941*	*0.5*
Variation S4-A2	*1,780,495*	*29,400*	*0*	*145*	*29,546*	*1,750,949*	*0.5*
Variation S4-A3	*1,780,495*	*29,400*	*0*	*148*	*29,549*	*1,750,946*	*0.5*
Tub Mountain South	1,780,495	29,400	0	813	30,213	1,750,282	2.7
Willow Creek	1,780,495	29,400	0	660	30,061	1,750,434	2.2

Table 3-730. Cumulative Effects Summary for Big Game in Segment 4—Brogan in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Pronghorn Winter Range							
Applicant's Proposed Action	0	0	0	0	0	0	None
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Tub Mountain South	70,917	438	0	289	727	70,189	39.8
Willow Creek	18,210	130	0	62	192	18,018	32.2
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

All alternative routes and route variations, would contribute to the cumulative loss and modification of mule deer and elk winter range; only the Willow Creek and Tub Mountain South Alternatives would contribute to the cumulative effects on pronghorn winter range. Under all alternative routes and route variations, the majority of big game habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, big game habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Segment 5—Malheur

Wildlife Habitat

Direct, indirect, and cumulative effects on wildlife habitat would be the same as direct, indirect, and cumulative effects on the vegetation communities discussed in Section 3.2.3 and the vegetation section above (Section 3.3.3.3), and are not discussed separately here.

Special Status Species

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for special status species. The amount of disturbance of vegetation community types used as habitat by special status species are compared by alternative route in Table 3-134 in Section 3.2.3. Special status species using wildlife habitats in Segment 5 are described in Section 3.2.4.5.

The types of potential direct and indirect effects and levels of residual impacts from the B2H Project on special status species in Segment 5 would be similar to those described for Segment 1. The cumulative effects on vegetation community types used as habitat by special status species are compared by alternative route and route variation in Table 3-720 in Section 3.3.3.3. Past and present actions and

RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for special status wildlife are presented in Table 3-719 in Section 3.3.3.3. Collision risk for bird species in the CIAA is discussed under Migratory Birds Including Raptors.

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of special status species habitat resulting from the past and present actions and RFFAs in the CIAA. Special status species habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on special status species habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Columbia Spotted Frog

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Columbia spotted frog. The only Columbia spotted frog habitat types that alternative routes and route variations cross in Segment 5 are suitable habitat (high potential) and potentially occupied habitat (higher quality); direct and indirect impacts on other habitat types would not be anticipated. Potential direct effects on Columbia spotted frog could include mortality; modification, fragmentation, and loss of habitat; displacement; and noise-related disturbance. Potential indirect effects on Columbia spotted frog could include alteration of native vegetation through introduction and spread of invasive plants and noxious weeds, increased predation risk, and increased water turbidity from fugitive dust. The types of potential direct and indirect effects on Columbia spotted frog are described in detail Section 3.2.2.6 under Types of Potential Effects. Direct and indirect impacts on Columbia spotted frog in Segment 5 are discussed by alternative route and route variation in Section 3.2.4.6.

Based on the impact assessment criteria used in this analysis (Table 3-139) and the duration of impacts criteria described under Methodology in Section 3.2.4.4, the Applicant's Proposed Action Alternative would have long-term moderate and low residual impacts on Columbia spotted frog. Long-term moderate residual impacts would result from impacts that would have adverse effects on Columbia spotted frog, but would not reduce population viability. Short-term low residual impacts would result from impacts that would have minor adverse effects on Columbia spotted frog and would not reduce population viability (MV-8 and Table 3-184).

Past and present actions in the CIAA that have likely affected Columbia spotted frog habitat include:

- Residential, commercial, and recreational development
- Roads
- Transmission lines

RFFAs in the CIAA for Columbia spotted frog for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining

A summary of the cumulative effects analysis is presented in Table 3-731.

Table 3-731. Cumulative Effects Summary for Columbia Spotted Frog in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Potentially Occupied Habitat (Higher Quality)							
Applicant's Proposed Action	78	0	0	2	2	77	100.0
Variation S5-A1	*78*	*0*	*0*	*1*	*1*	*77*	*100.0*
Variation S5-A2	*112*	*0*	*0*	*1*	*2*	*110*	*89.7*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Malheur S	673	8	0	19	27	646	71.8
Malheur A	673	8	0	19	26	647	71.1
Suitable Habitat							
Applicant's Proposed Action	3,129	128	0	40	168	2,961	23.8
Variation S5-A1	*772*	*9*	*0*	*10*	*20*	*752*	*51.7*
Variation S5-A2	*584*	*8*	*0*	*9*	*17*	*568*	*51.8*
Variation S5-B1	*904*	*69*	*0*	*12*	*80*	*824*	*14.5*
Variation S5-B2	*999*	*74*	*0*	*18*	*92*	*907*	*19.2*
Malheur S	2,425	87	0	43	130	2,296	33.3
Malheur A	2,471	112	0	39	151	2,320	25.9

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

All alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of Columbia spotted frog habitat resulting from the past and present actions and RFFAs in the CIAA. The majority of Columbia spotted frog habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Columbia spotted frog habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Greater Sage-Grouse

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Greater Sage-Grouse. The types of potential direct and indirect effects from the B2H Project in Segment 5 would be similar to those described for Segment 3 and are discussed in detail Section 3.2.4.6. Direct and indirect impacts on Greater Sage-Grouse in Segment 5 are discussed by alternative route and route variation in Section 3.2.4.6.

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) in Section 3.2.4.4) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the alternative routes and route variations would have long-term moderate residual impacts from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability (MV-9 and Table 3-186).

Past and present actions in the CIAA that have likely affected Greater Sage-Grouse habitat include:

- Aggregate/mineral mining
- Fiber optic lines
- Communication towers
- Residential and commercial development
- Roads
- Dams
- Transmission lines
- Railroads
- Wildfires
- Vegetation management

RFFAs in the CIAA for Greater Sage-Grouse habitat for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-732.

Table 3-732. Cumulative Effects Summary for Greater Sage-Grouse in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
General Habitat Management Areas							
Applicant's Proposed Action	301,135	1,889	0	237	2,125	299,009	11.1
Variation S5-A1	*118,757*	*624*	*0*	*0*	*624*	*118,133*	*None*
Variation S5-A2	*121,989*	*641*	*0*	*0*	*641*	*121,348*	*None*
Variation S5-B1	*75,071*	*676*	*0*	*4*	*681*	*74,390*	*0.7*
Variation S5-B2	*75,037*	*676*	*0*	*22*	*698*	*74,339*	*3.2*
Malheur S	377,515	2,294	0	496	2,790	374,725	17.8
Malheur A	382,050	2,296	0	545	2,842	379,208	19.2

Table 3-732. Cumulative Effects Summary for Greater Sage-Grouse in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Priority Habitat Management Areas							
Applicant's Proposed Action	*18,824*	*158*	*0*	*0*	*158*	*18,666*	*None*
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Malheur S	42,299	315	0	0	315	41,985	None
Malheur A	42,299	315	0	0	315	41,985	None

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Except for Variations S5-A1 and S5-A2, the alternative routes and route variations would contribute to the cumulative loss, fragmentation, and modification of Greater Sage-Grouse GHMA resulting from the past and present actions and RFFAs in the CIAA; none of the alternative routes or route variations would contribute to cumulative effects on PHMA.

Numerous large wildfires have affected areas of Greater Sage-Grouse habitat in the CIAA in Segment 5 (BLM n.d.; USGS 2016). The 22,112-acre Double Mountain Fire (2005) and the 31,320-acre Cow Hollow Fire (1996) burned GHMA in proximity to central portions of the Applicant's Proposed Action Alternative, as well as the southern end of Variations S5-A1 and S5-A2. The 46,511-acre Owyhee Fire (2013) burned GHMA crossed by southern portions of the Malheur S and Malheur A alternatives, as well a central portion of the Applicant's Proposed Action Alternative (BLM n.d.; USGS 2016).

Fires in Greater Sage-Grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of Greater Sage-Grouse habitats.

The majority of Greater Sage-Grouse habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Greater Sage-Grouse habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Portions of the Malheur S and Malheur A alternatives parallel existing high-voltage transmission lines that have degraded the existing quality of Greater Sage-Grouse habitats. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Migratory Birds Including Raptors

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for raptors and other migratory birds. The amount of disturbance to vegetation community types used as habitat by migratory birds is compared by alternative route and route variation in Table 3-134. Migratory bird habitats that would be disturbed, species that may be affected, and known bald and golden eagle nest occurrences are described in Section 3.2.4.5.

The types of potential direct and indirect impacts from the B2H Project in Segment 5 would be similar to those described for Segment 1 and are discussed in detail in Section 3.2.4.6. Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139) in Section 3.2.4.4 and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the B2H Project would have long-term moderate residual impacts on raptors and other migratory birds from removal or disturbance to nesting sites and from impacts that would have adverse effects on migratory birds but would not reduce population viability.

The cumulative effects on vegetation community types used as habitat by migratory birds are compared by alternative route and route variation in Table 3-720 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for migratory birds are presented in Table 3-719 in Section 3.3.3.3. Migratory bird collision mortality is caused in the greatest numbers by window strikes, but energy facilities such as transmission and distribution lines and wind turbines are a substantial proportion of annual collision mortality, as well. Existing and future communication towers, transmission and distribution lines, and wind-energy projects will continue to increase the collision mortality risk for migratory birds in the CIAA.

All alternative routes and route variations would contribute to the cumulative loss and modification of migratory bird habitat resulting from the past and present actions and RFFAs in the CIAA. Migratory bird habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on migratory bird habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Big Game

The potential direct and indirect effects from the B2H Project would contribute to the cumulative effects on mule deer, pronghorn, and elk winter range. The types of potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 5 would be the same as those described for Segment 1.

Past and present actions in the CIAA that have likely affected big game habitat include:

- Aggregate/mineral mining
- Communication towers
- Residential, recreational, and commercial development
- Power substations

- Dams
- Pipelines
- Roads
- Transmission lines
- Railroads
- Wildfires
- Vegetation management

RFFAs in the CIAA for big game habitat for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-733.

Table 3-733. Cumulative Effects Summary for Big Game in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Elk Winter Range							
Applicant's Proposed Action	658,743	5,430	0	45	5,476	653,267	0.8
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Malheur S	658,743	5,430	0	46	5,477	653,266	0.8
Malheur A	658,743	5,430	0	45	5,475	653,268	0.8
Mule Deer Winter Range							
Applicant's Proposed Action	1,780,495	29,400	0	523	29,923	1,750,572	1.7
Variation S5-A1	*1,780,495*	*29,400*	*0*	*24*	*29,425*	*1,751,070*	*<0.1*
Variation S5-A2	*1,780,495*	*29,400*	*0*	*4*	*29,405*	*1,751,090*	*<0.1*
Variation S5-B1	*1,780,495*	*29,400*	*0*	*53*	*29,453*	*1,751,042*	*0.2*
Variation S5-B2	*1,780,495*	*29,400*	*0*	*55*	*29,455*	*1,751,040*	*0.2*
Malheur S	1,780,495	29,400	0	455	29,855	1,750,640	1.5
Malheur A	1,780,495	29,400	0	422	29,823	1,750,672	1.4
Pronghorn Winter Range							
Applicant's Proposed Action	128,033	515	0	277	791	127,242	35.0
Variation S5-A1	*112,077*	*483*	*0*	*103*	*586*	*111,490*	*17.6*
Variation S5-A2	*112,077*	*483*	*0*	*118*	*601*	*111,476*	*19.6*

Table 3-733. Cumulative Effects Summary for Big Game in Segment 5—Malheur in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Malheur S	177,013	1,062	0	329	1,391	175,622	23.6
Malheur A	177,013	1,062	0	352	1,414	175,599	24.9
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

All alternative routes and route variations would contribute to the cumulative loss and modification of big game habitat. Under all alternative routes and route variations, the majority of big game habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, big game habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Segment 6—Treasure Valley

Wildlife Habitat

Direct, indirect, and cumulative effects on wildlife habitat would be the same as direct, indirect, and cumulative effects on the vegetation communities discussed in Section 3.2.3 and the vegetation section above (Section 3.3.3.3), and are not discussed separately here.

Special Status Species

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for special status species. The amount of disturbance to vegetation community types used as habitat by special status species are compared by alternative route in Table 3-137 in Section 3.2.3. Special status species using wildlife habitats in Segment 6 are described in Section 3.2.4.5.

The types of potential direct and indirect effects, and levels of residual impacts, from the B2H Project on special status species in Segment 6 would be the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by special status species are compared by alternative route and route variation in Table 3-722 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for special status wildlife are presented in Table 3-721 in Section 3.3.3.3. Collision risk for bird species in the CIAA is discussed under Migratory Birds Including Raptors.

The Applicant's Proposed Action Alternative and route variations would contribute to the cumulative loss, fragmentation, and modification of special status species habitat resulting from the past and

present actions and RFFAs in the CIAA. Special status species habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on special status species habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Columbia Spotted Frog

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Columbia spotted frog (Great Basin distinct population segment). The only Columbia spotted frog habitat type that the Applicant's Proposed Action Alternative and route variations would affect in Segment 6 is suitable habitat (high potential); direct and indirect impacts on other habitat types would not be anticipated. The types of potential direct and indirect effects would be similar to those described for Segment 2 and are described in detail in Section 3.2.2.6 under Types of Potential Effects. Direct and indirect impacts on Columbia spotted frog in Segment 6 are discussed by alternative route and route variation in Section 3.2.4.6.

Based on the impact assessment criteria used in this analysis (Table 3-139) and the duration of impacts criteria described under Methodology in Section 3.2.4.4, the Applicant's Proposed Action Alternative would have long-term low residual impacts on Columbia spotted frog. Long-term low residual impacts would result from impacts that would have minor adverse effects on Columbia spotted frog and would not reduce population viability (MV-8 and Table 3-192).

Past and present actions in the CIAA that have likely affected Columbia spotted frog habitat include:

- Aggregate/mineral mining
- Residential and commercial development
- Roads
- Transmission lines
- Wildfires
- Vegetation management

RFFAs in the CIAA for Columbia spotted frog for the B2H Project include:

- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-734.

Table 3-734. Cumulative Effects Summary for Columbia Spotted Frog Suitable Habitat in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	2,688	124	0	43	166	2,522	25.8
Variation S6-A1	*1,325*	*58*	*0*	*19*	*76*	*1,248*	*24.8*
Variation S6-A2	*1,455*	*74*	*0*	*9*	*82*	*1,373*	*10.4*
Variation S6-B1	*1,097*	*52*	*0*	*15*	*67*	*1,029*	*21.9*
Variation S6-B2	*1,124*	*53*	*0*	*11*	*63*	*1,060*	*16.9*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

The Applicant's Proposed Action Alternative and all route variations would contribute to the cumulative loss, fragmentation, and modification of Columbia spotted frog habitat resulting from the past and present actions and RFFAs in the CIAA. The majority of Columbia spotted frog habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Columbia spotted frog habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Greater Sage-Grouse

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on Greater Sage-Grouse. The types of potential direct and indirect effects from the B2H Project in Segment 6 would be similar to those described for Segment 3 and are discussed in detail Section 3.2.4.6. Direct and indirect impacts on Greater Sage-Grouse in Segment 6 are discussed by alternative route and route variation in Section 3.2.4.6.

Based on the impact assessment criteria used in the analysis of direct and indirect impacts (Table 3-139 in Section 3.2.4.4) and the criteria for duration of impacts described under Methodology in Section 3.2.4.4, the Applicant's Proposed Action Alternative and the route variations would have long-term moderate residual impacts from impacts that would have adverse effects on Greater Sage-Grouse, but would not reduce population viability (MV-9 and Table 3-190).

Past and present actions in the CIAA that have likely affected Greater Sage-Grouse habitat include:

- Aggregate/mineral mining
- Communication towers
- Commercial development
- Roads

- Transmission lines
- Dams
- Wildfires
- Vegetation management

RFFAs in the CIAA for Greater Sage-Grouse habitat for the B2H Project include:

- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis for Greater Sage-Grouse IHMA is presented in Table 3-735. The cumulative effects analysis results for Greater Sage-Grouse GHMA are not displayed, as the B2H Project in Segment 6 would not contribute to the cumulative effects on GHMA. Greater Sage-Grouse PHMA does not occur in the cumulative effects analysis area in Segment 6.

Table 3-735. Cumulative Effects Summary for Greater Sage-Grouse Important Habitat Management Areas in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	198,445	4,329	0	465	4,794	193,651	9.7
Variation S6-A1	*91,915*	*1,892*	*0*	*134*	*2,025*	*89,890*	*6.6*
Variation S6-A2	*91,269*	*1,886*	*0*	*110*	*1,997*	*89,272*	*5.5*
Variation S6-B1	*188,202*	*4,086*	*0*	*285*	*4,372*	*183,830*	*6.5*
Variation S6-B2	*190,589*	*4,105*	*0*	*288*	*4,393*	*186,196*	*6.6*

Table Notes:
Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.
Greater Sage-Grouse Priority Habitat Management Areas do not occur in the cumulative effects analysis area in Segment 6.
The cumulative effects analysis results for Greater Sage-Grouse General Habitat Management Areas are not displayed, as the B2H Project in Segment 6 would not contribute to the cumulative effects on General Habitat Management Areas.

The Applicant's Proposed Action Alternative and Variations S6-B1 and S6-B2 would contribute to the cumulative loss, fragmentation, and modification of Greater Sage-Grouse habitat in IHMA resulting from the past and present actions and RFFAs in the CIAA; however, some portions of IHMA consist of lands that serve as management buffers between developed areas and PHMA and are not identified as areas with ecological site characteristics suitable for Greater Sage-Grouse habitat or occupancy (Makela and Major 2012). Variations S6-A1 and S6-A2 cross IHMA, but the portions crossed are not identified as lands used by Greater Sage-Grouse (Makela and Major 2012). None of the alternative routes and route variations would contribute to cumulative effects on either PHMA or GHMA.

Wildfires have affected areas of Greater Sage-Grouse habitat in the CIAA in Segment 6 (BLM n.d.; USGS 2016). In particular, the 260,182-acre Soda Fire of 2015 burned the majority of the IHMA crossed by the B2H Project (BLM n.d.).

Fires in Greater Sage-Grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of Greater Sage-Grouse habitats.

The majority of Greater Sage-Grouse habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, Greater Sage-Grouse habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. The Applicant's Proposed Action Alternative and the route variations are adjacent to an existing 500-kV transmission line that has degraded the existing quality of Greater Sage-Grouse habitats. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

Migratory Birds Including Raptors

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on habitat for raptors and other migratory birds. The amount of disturbance to vegetation community types used as habitat by migratory birds is compared by alternative route and route variation in Table 3-137. Migratory bird habitats that would be disturbed, species that may be affected, and known bald and golden eagle nest occurrences are described in Section 3.2.4.5.

The types of potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 6 would be the same as those described for Segment 1. The cumulative effects on vegetation community types used as habitat by migratory birds are compared by alternative route and route variation in Table 3-722 in Section 3.3.3.3. Past and present actions and RFFAs in the CIAA that have likely affected vegetation communities that provide habitat for migratory birds are presented in Table 3-721 in Section 3.3.3.3. Migratory bird collision mortality is caused in the greatest numbers by window strikes, but energy facilities such as transmission and distribution lines and wind turbines are a substantial proportion of annual collision mortality, as well. Wind energy in particular causes a high risk of collision to some long-lived species sensitive to additional mortality, such as the golden eagle and other raptors (Drewitt and Langston 2008). Existing and future communication towers, transmission and distribution lines, and wind-energy projects will continue to increase the collision mortality risk for migratory birds in the CIAA.

The Applicant's Proposed Action Alternative and all variations would contribute to the cumulative loss and modification of migratory bird habitat resulting from the past and present actions and RFFAs in the CIAA. Migratory bird habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project described above. Moreover, the contribution of the B2H Project to the cumulative effects on migratory bird habitat would be anticipated to be relatively small compared to the combined effects of other actions.

Big Game

The potential direct and indirect effects from the B2H Project would contribute to the cumulative effects on mule deer winter range and bighorn sheep population management units. The types of potential direct and indirect effects and levels of residual impacts from the B2H Project in Segment 6 would be the same as those described for Segment 1.

Past and present actions in the CIAA that have likely affected big game habitat include:

- Aggregate/mineral mining
- Communication towers
- Residential, recreational, and commercial development
- Power substations
- Dams
- Pipelines
- Roads
- Transmission lines
- Railroads
- Wildfires
- Vegetation management

RFFAs in the CIAA for big game habitat for the B2H Project include:

- Oil and gas development
- Aggregate/mineral mining
- Vegetation management

A summary of the cumulative effects analysis is presented in Table 3-736.

Table 3-736. Cumulative Effects Summary for Big Game in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Mule Deer Winter Range							
Applicant's Proposed Action	1,933,113	30,872	0	173	31,045	1,902,068	0.6
Variation S6-A1	*1,780,495*	*29,400*	*0*	*51*	*29,451*	*1,751,044*	*0.2*
Variation S6-A2	*1,780,495*	*29,400*	*0*	*43*	*29,443*	*1,751,052*	*0.1*
Variation S6-B1	*152,618*	*1,472*	*0*	*90*	*1,562*	*151,056*	*5.8*
Variation S6-B2	*152,618*	*1,472*	*0*	*104*	*1,576*	*151,042*	*6.6*

Table 3-736. Cumulative Effects Summary for Big Game in Segment 6—Treasure Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Bighorn Sheep Population Management Units in Idaho							
Applicant's Proposed Action	203,747	2,476	0	368	2,843	200,904	12.9
Variation S6-A1	*203,747*	*2,476*	*0*	*136*	*2,611*	*201,136*	*5.2*
Variation S6-A2	*203,747*	*2,476*	*0*	*129*	*2,605*	*201,142*	*5.0*
Variation S6-B1	*203,747*	*2,476*	*0*	*230*	*2,706*	*201,041*	*8.5*
Variation S6-B2	*203,747*	*2,476*	*0*	*280*	*2,756*	*200,992*	*10.2*
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

The Applicant's Proposed Action Alternative and all route variations would contribute to the cumulative loss and modification of big game habitat. Under all alternative routes and route variations, the majority of big game habitat would remain undisturbed by the B2H Project and other actions in the CIAA. Also, big game habitat adjacent to existing human development is likely to have previously incurred some of the potential direct and indirect effects from the B2H Project. Moreover, the effects of the B2H Project would be anticipated to be small compared to the effects of other actions.

3.3.3.5 Fish Resources

This section estimates cumulative effects on fish resources from B2H Project effects in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.5.

Issues Identified for Analysis

Potential impacts on federally listed and candidate fish species, special status fish species and protected fish habitat were identified as potential cumulative effects. Past, present, and future actions in the B2H Project vicinity have cumulatively affected fish and fish habitat through destruction and modification of habitat, limiting access to habitat through the installation of fish passage barriers, and degradation of water quality. These actions include utility and road construction and maintenance, road use, residential development activities that expose and disturb the ground surface near streams, ranching, and agricultural activities. They also include periodic vegetation management activities, hydropower development, and recreational and commercial fishing. Harvest of fish resources, in both the Columbia River and its tributaries and the ocean, has further affected these resources. In recent years these conditions have all been improving with better passage conditions, habitat restoration efforts, and directed harvest management.

Reasonably foreseeable future activities that would affect fish and fish habitat, including infrastructure maintenance with periodic replacement, residential development and ongoing ranching and agricultural activities are expected to continue at similar intensities as in recent years, with similar levels of impacts. The B2H Project would contribute, although in a minor way, to these cumulative impacts on fish and fish habitat, through installation of structures and access road work near waterways that could remove riparian vegetation and cause erosion and result in the deposition of sediments in waterways.

Regional efforts to protect and recover threatened and endangered fish in the Columbia River Basin are comprehensive and reflect the complex life cycles of the fish themselves. Progress has been made each year by building step by step on each preceding year's successful effort. Federal, state, and tribal entities with regional interests implement actions to strengthen Columbia River Basin salmon and steelhead stocks through the federal-state-tribal Regional Implementation Oversight Group, the Columbia Basin Fish Accords, and the Northwest Power and Conservation Council's Fish and Wildlife Program, among others.

As a result of past and present actions, three ESU/DPSs in the B2H Project area have been listed under the federal ESA, while other populations and species have been identified as sensitive or species of concern. Biological and physical conditions caused by human activities or natural process that limit a species' viability are referred to by NMFS as limiting factors. Limiting factors for the three federally listed by NMFS species present in the B2H Project area are summarized below.

Middle Columbia River Steelhead

Limiting factors for MCR summer steelhead include (NMFS 2014):

- Degraded freshwater habitat—Floodplain connectivity and function, channel structure and complexity, riparian areas, fish passage, stream substrate, stream flow, and water quality have been degraded as a result of cumulative impacts of agriculture, forestry, tributary hydropower system activities, and development.
- Impacts related to Mainstem Columbia River hydropower
- Degraded estuarine and nearshore marine habitat
- Hatchery-related effects
- Harvest-related effects
- Effects of predation, competition, and disease

Snake River Basin Steelhead

Limiting factors for SRB steelhead include (NMFS 2014):

- Impacts related to Mainstem Columbia River hydropower
- Impaired tributary fish passage
- Degraded freshwater habitat—Floodplain connectivity and function, channel structure and complexity, riparian areas and large wood recruitment, stream flow, and water quality have been degraded as a result of cumulative impacts of agriculture, forestry, and development.

- Impaired water quality and increased water temperature
- Related harvest effects, particularly for B-run steelhead
- Predation
- Genetic diversity effects from out-of-population hatchery releases

Snake River Spring/Summer-Run Chinook Salmon

Limiting factors for Snake River spring/summer-run Chinook salmon include (NMFS 2014):

- Degraded freshwater habitat—Floodplain connectivity and function, channel structure and complexity, riparian areas and large wood supply, stream substrate, elevated water temperature, stream flow, and water quality have been degraded as a result of cumulative impacts of agriculture, forestry, and development.
- Impacts related to Mainstem Columbia River hydropower
- Harvest-related effects
- Predation

These limiting factors are similar to the USFWS primary threats to survival for federally listed Columbia River bull trout, which are present in the B2H Project area.

Cumulative effects on federally listed fish species, special status fish species, and protected fish habitats, as well as traditional foods, are anticipated with the implementation of the B2H Project as a result of anticipated direct and indirect effects, such as:

- temporary transport of sediment to waterways from upland locations due to construction of new access roads and vegetation clearing
- altered predator-prey relationships as a result of sediment transport into waterways from upland locations and temporary removal of riparian vegetation
- increased sediment input into waterways as a result of the operation of new permanent access roads and removal or management of vegetation for operation and maintenance activities
- increased risk of habitat degradation as a result of public use of permanent access roads
- short-term reduction in water quality due to herbicide drift and runoff

Compared to the combined cumulative impacts of past and ongoing fish habitat alteration in the study area, the incremental contribution of the Proposed Action to cumulative impacts on fish and fish habitat would be relatively low. These effects are described in greater detail in Section 3.2.5.6.

EXISTING CONDITION

The B2H Project area includes a portion of the Columbia Plateau and the northern Great Basin physiographic provinces. The major rivers in the B2H Project area are the Columbia River to the northwest and the Snake River to the east.

Agriculture, residential, commercial, and industrial development has modified existing fish habitats throughout the B2H Project area. As a result of past and present actions in the geographic area of

influence, the following examples of affects have occurred to fish and fish resources in the B2H Project area:

- Water quality has been degraded by timber harvest, livestock grazing, channel straightening, diking, removal of instream wood, and the construction of transportation corridors (Tetra Tech 2010).
- Water diversions and land-use practices have reduced fish access to side channels along stream courses (NMFS 2004a).
- Water developments have altered natural stream flows through water storage and irrigation diversions (NMFS 2004a, 2004b).

The existing conditions of fish and fish habitat are described in detail for the B2H Project area in Section 3.2.5.

Traditional Foods

The direct and indirect effects from the B2H Project would contribute to the cumulative effects on resources that are considered traditional foods by Native American tribes. These resources include fish and fish habitat and are analyzed above. Potential effects of the B2H Project on traditional foods are discussed in Section 3.2.5.

In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of mapped fish resources in the CIAA. Also, conservation measures for the B2H Project to reduce negative effects on water and fish include design features for environmental protection and selective mitigation measures that are applied to mitigate site- and/or resource-specific impacts of the B2H Project (refer to Section 3.2.5.4). As a result, cumulative effects on traditional foods are anticipated to be minimal.

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

As described in Section 3.2.5, impacts on fish and fish resources from the B2H Project could mainly occur from the construction of new access roads, the upgrade of existing access roads, and the clearing of riparian vegetation.

Permanent impacts on fish and fish resources would include loss of tall riparian vegetation and altered predator-prey relationships, and may include a localized increase to stream temperature by reducing shade producing capability. Temporary impacts would include short-term increase in turbidity from upland sediment transport to waterways and short-term reduction in water quality due to herbicide drift and runoff.

Several past and present actions in the CIAA are likely to have similarly affected fish and fish resources through removal of streamside vegetation, construction of impervious surfaces that may increase the transport of untreated stormwater directly to waterways, and disturbances to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on fish and fish resources, though

it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on fish and fish resources. A summary of past and present actions include:

- Oil and/or gas development
- Mining operations
- Wind development
- Construction of transmission lines
- Transportation corridor construction and maintenance (e.g., roads and railroads)
- Agricultural operations and livestock grazing
- Water development/dams
- Residential development/structures
- Vegetation management
- Wildfires

A summary of RFFAs include:

- Oil and/or gas development
- Wind development

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 1 would contribute to and increase the cumulative impacts on fish and fish resources (refer to Table 3-737). Table 3-688 summarizes the extent of the stream resources in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-737. Cumulative Effects Summary for Fish in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Bull Trout Critical Habitat							
Applicant's Proposed Action	475	0	0	0	0	475	None
Variation S1-B1	*3*	*0*	*0*	*0*	*0*	*2*	*None*
Variation S1-B2	*3*	*0*	*0*	*0*	*0*	*2*	*None*
East of Bombing Range Road	475	0	0	0	0	475	None
Applicant's Proposed Action – Southern Route	475	0	0	0	0	475	None
West of Bombing Range Road – Southern Route	472	0	0	0	0	471	None

Table 3-737. Cumulative Effects Summary for Fish in Segment 1—Morrow-Umatilla in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Longhorn	1,033	6	0	0	6	1,027	None
Interstate 84	4,454	352	0	3	355	4,099	0.9
Variation S1-A1	*1,906*	*139*	*0*	*2*	*141*	*1,765*	*1.5*
Variation S1-A2	*1,907*	*140*	*0*	*3*	*142*	*1,765*	*1.8*
Interstate 84 – Southern Route	4,454	352	0	3	355	4,099	0.9
Chinook Salmon Essential Fish Habitat[1]							
Applicant's Proposed Action	795	172	0	0	172	623	None
Variation S1-B1	*1*	*0*	*0*	*0*	*0*	*1*	*None*
Variation S1-B2	*1*	*0*	*0*	*0*	*0*	*1*	*None*
East of Bombing Range Road	795	172	0	0	172	623	None
Applicant's Proposed Action – Southern Route	497	0	0	0	0	497	None
West of Bombing Range Road – Southern Route	492	0	0	0	0	492	None
Longhorn	1,353	177	0	0	177	1,176	None
Interstate 84	5,057	566	0	3	569	4,489	0.6
Variation S1-A1	*1,926*	*148*	*0*	*2*	*150*	*1,776*	*1.4*
Variation S1-A2	*1,928*	*149*	*0*	*3*	*152*	*1,777*	*1.7*
Interstate 84 – Southern Route	4,759	394	0	3	397	4,362	0.8
Middle Columbia River Steelhead Critical Habitat							
Applicant's Proposed Action	2,486	368	0	2	371	2,115	0.6
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
East of Bombing Range Road	2,486	368	0	2	371	2,115	0.6
Applicant's Proposed Action – Southern Route	5,740	347	0	7	355	5,385	2.1
West of Bombing Range Road – Southern Route	7,135	404	0	11	414	6,721	2.6
Longhorn	2,674	368	0	2	371	2,303	0.6

Table 3-737. Cumulative Effects Summary for Fish in Segment 1—Morrow-Umatilla in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	6,648	755	0	5	760	5,888	0.7
Variation S1-A1	*1,909*	*139*	*0*	*2*	*141*	*1,768*	*1.5*
Variation S1-A2	*1,910*	*140*	*0*	*3*	*142*	*1,768*	*1.9*
Interstate 84 – Southern Route	9,903	734	0	11	744	9,158	1.4
Snake River Basin Steelhead Critical Habitat							
Applicant's Proposed Action	2,627	97	0	2	100	2,527	2.5
Variation S1-B1	*2,324*	*97*	*0*	*3*	*100*	*2,224*	*2.7*
Variation S1-B2	*2,324*	*97*	*0*	*7*	*105*	*2,219*	*7.1*
East of Bombing Range Road	2,627	97	0	2	100	2,527	2.5
Applicant's Proposed Action – Southern Route	2,627	97	0	3	100	2,527	2.5
West of Bombing Range Road – Southern Route	2,627	97	0	3	100	2,527	2.6
Longhorn	2,815	97	0	3	100	2,715	2.5
Interstate 84	2,815	97	0	3	100	2,715	2.5
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Interstate 84 – Southern Route	2,815	97	0	3	100	2,715	2.6
Redband Trout Occupied Streams							
Applicant's Proposed Action	16,588	995	0	29	1,024	15,564	2.8
Variation S1-B1	*2,452*	*99*	*0*	*3*	*102*	*2,349*	*2.8*
Variation S1-B2	*2,452*	*99*	*0*	*8*	*108*	*2,344*	*7.5*
East of Bombing Range Road	16,588	995	0	29	1,024	15,564	2.8
Applicant's Proposed Action – Southern Route	19,120	872	0	30	901	18,219	3.3
West of Bombing Range Road – Southern Route	22,774	1,063	61	42	1,166	21,608	3.6
Longhorn	16,588	995	0	29	1,024	15,563	2.9
Interstate 84	19,249	1,374	0	38	1,413	17,836	2.7
Variation S1-A1	*3,728*	*288*	*0*	*11*	*300*	*3,428*	*3.8*
Variation S1-A2	*3,730*	*289*	*0*	*5*	*294*	*3,436*	*1.8*

Table 3-737. Cumulative Effects Summary for Fish in Segment 1—Morrow-Umatilla in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84 – Southern Route	*21,781*	*1,251*	*0*	*39*	*1,290*	*20,491*	*3.0*
Table Notes: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total. Chinook salmon essential fish habitat is used as a surrogate for coho salmon essential fish habitat							

Cumulative effects of projects and actions in Segment 1 on federally listed fish species and associated habitats are summarized below as a percentage of area per route that would be affected by the B2H Project:

- The mean percentage of project impacts on bull trout and associated critical habitat for all alternatives and variations in Segment 1 is 0.5 percent of the total area, with a low of 0.0 percent for 7 of the 11 routes and a high of 1.8 percent for the Interstate 84 Variation S1-A2.
- The mean percentage of project impacts on Chinook salmon and associated essential fish habitat for all alternatives and variations in Segment 1 is 0.4 percent of the total area, with a low of 0.0 percent for 7 of the 11 routes and a high of 1.7 percent for the Interstate 84 Variation S1-A2.
- The mean percentage of project impacts on Coho salmon and associated essential fish habitat for all alternatives and variations in Segment 1 would be a little higher than the 0.4 percent of the total area for Chinook salmon, with a low of 0.0 percent for only 5 of the 11 routes, instead of 7, and a high of 1.7 percent, similar to Chinook salmon, for the Interstate 84 Variation S1-A2. Coho salmon essential fish habitat is present in Birch Creek (Applicant's Proposed Action Alternative and East of Bombing Range Road); Chinook salmon essential fish habitat is not.
- The mean percentage of project impacts on Middle Columbia steelhead and associated critical habitat for all alternatives and variations in Segment 1 is 1.1 percent, with a low of 0.0 percent for 2 of the 11 routes and a high of 2.6 percent for the West of Bombing Range Road – Southern Route.
- The mean percentage of project impacts on Snake River Basin steelhead and associated critical habitat in for all alternatives and variations in Segment 1 is 2.5 percent with a low of 0.0 percent for 2 of the 11 routes and a high of 7.1 percent for the Applicant's Proposed Action Alternative, Variation S1-B2.

Generally, impacts range between 0.0 and 2.6 percent impact for all alternatives and variations. Therefore, the ranges of cumulative effects are relatively equal among routes. However, the outlier is the Applicant's Proposed Action Alternative, Variation S1-B2 with 7.1 percent of B2H Project impact on SRB steelhead and associated critical habitat.

Sensitive Fish Species

All alternatives and variations in Segment 1 cross streams which support redband trout. The percentage of B2H Project impacts on redband trout occupied streams range from 1.8 to 7.5 percent with Variation S1-A2 resulting in the lowest impacts at 1.8 percent and Variation S1-B2 resulting in the highest impacts at 7.5 percent.

Protected Fish Habitats

Cumulative effects on protected fish habitats are the same as cumulative effects discussed with the federally listed and sensitive fish species above.

Segment 2—Blue Mountains

As described in Section 3.2.5, impacts on fish and fish resources from the B2H Project could mainly occur from the construction of new access roads, the upgrade of existing access roads, and the clearing of riparian vegetation.

Permanent impacts on fish and fish resources would include loss of tall riparian vegetation and altered predator-prey relationships, and may include a localized increase to stream temperature by reducing shade producing capability. Temporary impacts would include short-term increase in turbidity from upland sediment transport to waterways and short-term reduction in water quality due to herbicide drift and runoff.

Several past and present actions in the CIAA are likely to have similarly affected fish and fish resources through removal of streamside vegetation, construction of impervious surfaces that may increase the transport of untreated stormwater directly to waterways, and disturbances to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on fish and fish resources, though it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on fish and fish resources. A summary of past and present actions for Segment 2 include:

- Oil and/or gas development
- Mining operations
- Wind development
- Construction of transmission lines
- Transportation corridor construction and maintenance (e.g., roads and railroads)
- Agricultural operations and livestock grazing
- Water development/dams
- Residential development/structures
- Vegetation management
- Wildfires

A summary of RFFAs for Segment 2 include:

- None identified

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 2 would contribute to and increase the cumulative impacts on fish and fish resources (refer to Table 3-738). Table 3-692 summarizes the extent of the stream resources in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-738. Cumulative Effects Summary for Fish in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Bull Trout Critical Habitat							
Applicant's Proposed Action	1,047	153	0	2	155	892	1.0
Variation S2-A1	*1,007*	*153*	*0*	*0*	*153*	*854*	*None*
Variation S2-A2	*1,007*	*153*	*0*	*0*	*153*	*854*	*None*
Variation S2-B1	*1,008*	*153*	*0*	*0*	*153*	*855*	*None*
Variation S2-B2	*1,008*	*153*	*0*	*0*	*153*	*855*	*None*
Variation S2-C1	*2*	*0*	*0*	*0*	*0*	*2*	*None*
Variation S2-C2	*8*	*5*	*0*	*0*	*5*	*3*	*None*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-E2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-F1	*38*	*0*	*0*	*0*	*0*	*38*	*None*
Variation S2-F2	*38*	*0*	*0*	*0*	*0*	*38*	*None*
Glass Hill	1,047	153	0	2	155	892	1.0
Variation S2-D1	*2*	*0*	*0*	*0*	*0*	*2*	*None*
Variation S2-D2	*2*	*0*	*0*	*0*	*0*	*2*	*None*
Mill Creek	1,532	310	0	2	312	1,220	0.7
Chinook Salmon Critical Habitat							
Applicant's Proposed Action	1,339	170	0	6	176	1,163	3.5
Variation S2-A1	*1,021*	*157*	*0*	*0*	*157*	*864*	*None*
Variation S2-A2	*1,021*	*157*	*0*	*0*	*157*	*864*	*None*
Variation S2-B1	*1,338*	*170*	*0*	*5*	*174*	*1,164*	*2.6*
Variation S2-B2	*1,338*	*170*	*0*	*4*	*174*	*1,165*	*2.2*
Variation S2-C1	*318*	*13*	*0*	*0*	*13*	*305*	*None*
Variation S2-C2	*325*	*19*	*0*	*0*	*19*	*306*	*None*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*	*None*

Table 3-738. Cumulative Effects Summary for Fish in Segment 2—Blue Mountains in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S2-E2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-F1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-F2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Glass Hill	1,339	170	0	2	171	1,168	0.9
Variation S2-D1	*318*	*13*	*0*	*0*	*13*	*305*	*None*
Variation S2-D2	*318*	*13*	*0*	*0*	*13*	*305*	*None*
Mill Creek	1,830	364	0	6	369	1,461	1.6
Snake River Basin Steelhead Critical Habitat							
Applicant's Proposed Action	4,185	216	0	14	230	3,955	6.1
Variation S2-A1	*1,948*	*173*	*0*	*0*	*173*	*1,775*	*None*
Variation S2-A2	*1,948*	*173*	*0*	*0*	*173*	*1,775*	*None*
Variation S2-B1	*3,253*	*197*	*0*	*10*	*206*	*3,047*	*4.7*
Variation S2-B2	*3,253*	*197*	*0*	*6*	*203*	*3,051*	*3.1*
Variation S2-C1	*2,237*	*43*	*0*	*3*	*46*	*2,191*	*6.7*
Variation S2-C2	*3,251*	*271*	*0*	*6*	*277*	*2,974*	*2.3*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-E2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-F1	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Variation S2-F2	*0*	*0*	*0*	*0*	*0*	*0*	*None*
Glass Hill	4,185	216	0	10	226	3,959	4.6
Variation S2-D1	*2,237*	*43*	*0*	*10*	*53*	*2,184*	*19.0*
Variation S2-D2	*2,237*	*43*	*0*	*10*	*53*	*2,185*	*18.2*
Mill Creek	6,468	713	0	12	724	5,744	1.6
Redband Trout Occupied Streams							
Applicant's Proposed Action	10,876	397	0	53	451	10,425	11.8
Variation S2-A1	*1,971*	*177*	*0*	*0*	*177*	*1,794*	*None*
Variation S2-A2	*1,971*	*177*	*0*	*0*	*177*	*1,794*	*None*
Variation S2-B1	*4,345*	*226*	*0*	*10*	*236*	*4,109*	*4.2*
Variation S2-B2	*4,345*	*226*	*0*	*7*	*233*	*4,112*	*3.0*
Variation S2-C1	*4,555*	*119*	*0*	*7*	*126*	*4,428*	*5.8*
Variation S2-C2	*5,575*	*360*	*0*	*14*	*374*	*5,200*	*3.7*
Variation S2-E1	*1,431*	*56*	*0*	*3*	*60*	*1,371*	*5.3*
Variation S2-E2	*1,431*	*56*	*0*	*3*	*60*	*1,371*	*5.6*
Variation S2-F1	*4,350*	*101*	*0*	*28*	*129*	*4,221*	*21.6*
Variation S2-F2	*4,350*	*101*	*0*	*20*	*121*	*4,229*	*16.4*
Glass Hill	10,876	397	0	59	456	10,420	12.9

Table 3-738. Cumulative Effects Summary for Fish in Segment 2—Blue Mountains in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S2-D1	*3,315*	*69*	*0*	*10*	*79*	*3,236*	*12.8*
Variation S2-D2	*3,315*	*69*	*0*	*10*	*78*	*3,237*	*12.5*
Mill Creek	*12,554*	*942*	*0*	*31*	*973*	*11,580*	*3.2*
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Federally Listed and Candidate Fish Species and Associated Habitats

Cumulative effects of projects and actions in Segment 2 on federally listed fish species and associated habitats are summarized below as a percentage of area per route that would be affected by the B2H Project:

- The mean percentage of project impacts on bull trout and associated critical habitat for all alternatives and variations in Segment 1 is 0.2 percent of the total area, with a low of 0.0 percent for 12 of the 15 routes and a high of 1.0 percent for both the Applicant's Proposed Action Alternative and the Glass Hill Alternative.
- The mean percentage of project impacts on Chinook salmon and associated essential fish habitat for all alternatives in Segment 2 is 0.7 percent of the total area, with a low of 0.0 percent for 10 of the 15 routes and a high of 3.5 percent for the Applicant's Proposed Action Alternative.
- The mean percentage of project impacts on Snake River Basin steelhead and associated critical habitat in for all alternatives in Segment 2 is 4.4 percent with a low of 0.0 percent for 6 of the 15 routes and a high of 19.0 percent for Variation S2-D1.

Generally, impacts range between 0.0 and 19.0 percent impact for all alternatives. Therefore, the ranges of cumulative effects are relatively similar among routes. However, the outlier is Variation S2-D1 with 19.0 percent of B2H Project impact on SRB steelhead and associated critical habitat.

Sensitive Fish Species

All alternatives and variations in Segment 2 cross streams which support redband trout except for Variations S2-A1 and S2-A2. Excluding Variations S2-A1 and S2-A2, the percentage of B2H Project impacts on redband trout occupied streams range from 3.0 to 21.6 percent, with Variation S2-F1 resulting in the greatest percentage of B2H Project impact.

Protected Fish Habitats

Cumulative effects on protected fish habitats are the same as cumulative effects discussed with the federally listed and candidate fish species above.

Segment 3—Baker Valley

As described in Section 3.2.5, impacts on fish and fish resources from the B2H Project could mainly occur from the construction of new access roads, the upgrade of existing access roads, and the clearing of riparian vegetation.

Permanent impacts on fish and fish resources would include loss of tall riparian vegetation and altered predator-prey relationships, and may include a localized increase to stream temperature by reducing shade producing capability. Temporary impacts would include short-term increase in turbidity from upland sediment transport to waterways and short-term reduction in water quality due to herbicide drift and runoff.

Several past and present actions in the CIAA are likely to have similarly affected fish and fish resources through removal of streamside vegetation, construction of impervious surfaces that may increase the transport of untreated stormwater directly to waterways, and disturbances to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on fish and fish resources, though it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on fish and fish resources. A summary of past and present actions for Segment 3 include:

- Oil and/or gas development
- Mining operations
- Wind development
- Construction of transmission lines
- Transportation corridor construction and maintenance (e.g., roads and railroads)
- Agricultural operations and livestock grazing
- Water development/dams
- Residential development/structures
- Vegetation management
- Wildfires

A summary of RFFAs for Segment 3 include:

- Mining operations

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 3 would contribute to and increase the cumulative impacts on fish and fish resources (refer to Table 3-739). Table 3-696 summarizes the extent of the stream resources in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-739. Cumulative Effects Summary for Redband Trout Occupied Streams in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	14,413	1,001	0	63	1,064	13,349	5.9
Variation S3-A1	*1,756*	*45*	*0*	*22*	*67*	*1,689*	*32.4*
Variation S3-A2	*3,369*	*55*	*0*	*11*	*66*	*3,302*	*16.8*
Variation S3-B1	*2,676*	*132*	*0*	*0*	*132*	*2,544*	*None*
Variation S3-B2	*2,748*	*245*	*0*	*0*	*245*	*2,503*	*None*
Variation S3-B3	*2,748*	*245*	*0*	*0*	*245*	*2,503*	*None*
Variation S3-B4	*2,748*	*245*	*0*	*0*	*245*	*2,503*	*None*
Variation S3-B5	*2,748*	*245*	*0*	*0*	*245*	*2,503*	*None*
Variation S3-C1	*9,426*	*751*	*0*	*39*	*791*	*8,636*	*5.0*
Variation S3-C2	*9,426*	*751*	*0*	*41*	*792*	*8,634*	*5.1*
Variation S3-C3	*7,744*	*704*	*0*	*26*	*730*	*7,013*	*3.6*
Variation S3-C4	*7,744*	*704*	*0*	*22*	*726*	*7,018*	*3.0*
Variation S3-C5	*7,744*	*704*	*0*	*24*	*728*	*7,015*	*3.3*
Variation S3-C6	*6,207*	*349*	*0*	*34*	*383*	*5,824*	*8.9*
Flagstaff A	14,485	1,114	0	63	1,176	13,309	5.3
Timber Canyon	26,585	1,120	0	96	1,216	25,369	7.9
Flagstaff A – Burnt River Mountain	12,802	1,066	0	50	1,116	11,686	4.5
Flagstaff B	14,485	1,114	0	62	1,176	13,309	5.3
Flagstaff B – Burnt River West	14,415	1,076	0	36	1,112	13,302	3.3
Flagstaff B – Durkee	11,266	711	0	57	768	10,497	7.4
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Federally Listed and Candidate Fish Species and Associated Habitats

Segment 3 does not cross any streams which support federally listed or candidate fish species.

Sensitive Fish Species

All alternatives and variations in Segment 3 cross streams which support redband trout except for the Variation S3-B series. Excluding the Variation S3-B series, the percentage of B2H Project impacts on redband trout occupied streams range from 3.0 to 32.4 percent, with Variation S3-A1 resulting in the greatest percentage of B2H Project impact.

Protected Fish Habitats

Segment 3 does not cross any streams which support protected fish habitats.

Segment 4—Brogan

As described in Section 3.2.5, impacts on fish and fish resources from the B2H Project could mainly occur from the construction of new access roads, the upgrade of existing access roads, and the clearing of riparian vegetation.

Permanent impacts on fish and fish resources would include loss of tall riparian vegetation and altered predator-prey relationships, and may include a localized increase to stream temperature by reducing shade producing capability. Temporary impacts would include short-term increase in turbidity from upland sediment transport to waterways and short-term reduction in water quality due to herbicide drift and runoff.

Several past and present actions in the CIAA are likely to have similarly affected fish and fish resources through removal of streamside vegetation, construction of impervious surfaces that may increase the transport of untreated stormwater directly to waterways, and disturbances to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on fish and fish resources, though it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on fish and fish resources. A summary of past and present actions for Segment 4 include:

- Oil and/or gas development
- Mining operations
- Construction of transmission lines
- Transportation corridor construction and maintenance (e.g., roads and railroads)
- Agricultural operations and livestock grazing
- Water development/dams
- Residential development/structures
- Vegetation management
- Wildfires

A summary of RFFAs for Segment 3 include:

- Oil and/or gas development
- Mining operations

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 4 would contribute to and increase the cumulative impacts on fish and fish resources (refer to Table 3-740). Table 3-700 summarizes the extent of the stream resources in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-740. Cumulative Effects Summary for Redband Trout Occupied Streams in Segment 4—Brogan in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	9,071	602	0	20	622	8,449	3.2
Variation S4-A1	*2,684*	*348*	*0*	*6*	*354*	*2,330*	*1.8*
Variation S4-A2	*2,684*	*348*	*0*	*6*	*354*	*2,330*	*1.8*
Variation S4-A3	*2,684*	*348*	*0*	*7*	*355*	*2,329*	*2.0*
Tub Mountain South	9,851	661	0	28	689	9,162	4.1
Willow Creek	6,263	462	0	17	479	5,784	3.5
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Federally Listed and Candidate Fish Species and Associated Habitats

Segment 4 does not cross any streams which support federally listed or candidate fish species.

Sensitive Fish Species

All alternatives and variations in Segment 4 cross streams which support redband trout. The percentage of B2H Project impacts on redband trout occupied streams range from 1.8 to 4.1 percent, with Variations S4-A1 and S4-A2 resulting in the lowest impacts at 1.8 percent and the Tub Mountain South Alternative resulting in the highest impacts at 4.1 percent.

Protected Fish Habitats

Segment 4 does not cross any streams which support protected fish habitats.

Segment 5—Malheur

As described in Section 3.2.5, impacts on fish and fish resources from the B2H Project could mainly occur from the construction of new access roads, the upgrade of existing access roads, and the clearing of riparian vegetation.

Permanent impacts on fish and fish resources would include loss of tall riparian vegetation and altered predator-prey relationships, and may include a localized increase to stream temperature by reducing shade producing capability. Temporary impacts would include short-term increase in turbidity from upland sediment transport to waterways and short-term reduction in water quality due to herbicide drift and runoff.

Several past and present actions in the CIAA are likely to have similarly affected fish and fish resources through removal of streamside vegetation, construction of impervious surfaces that may increase the transport of untreated stormwater directly to waterways, and disturbances to soils. Construction of

several RFFAs in the CIAA could result in similar cumulative effects on fish and fish resources, though it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on fish and fish resources. A summary of past and present actions for Segment 5 include:

- Mining operations
- Construction of transmission lines
- Transportation corridor construction and maintenance (e.g., roads and railroads)
- Agricultural operations and livestock grazing
- Residential development/structures
- Vegetation management
- Wildfires

A summary of RFFAs for Segment 3 include:

- Oil and/or gas development

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 5 would contribute to and increase the cumulative impacts on fish and fish resources (refer to Table 3-741). Table 3-704 summarizes the extent of the stream resources in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-741. Cumulative Effects Summary for Redband Trout Occupied Streams in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	9,492	436	0	19	455	9,037	4.3
Variation S5-A1	*1,285*	*111*	*0*	*0*	*111*	*1,174*	*None*
Variation S5-A2	*1,285*	*111*	*0*	*0*	*111*	*1,174*	*None*
Variation S5-B1	*1,638*	*137*	*0*	*8*	*145*	*1,493*	*5.7*
Variation S5-B2	*1,638*	*137*	*0*	*5*	*141*	*1,497*	*3.4*
Malheur S	5,897	221	0	11	233	5,665	4.8
Malheur A	5,897	221	0	11	232	5,665	4.6

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Federally Listed and Candidate Fish Species and Associated Habitats

Segment 5 does not cross any streams which support federally listed or candidate fish species.

Sensitive Fish Species

All alternatives and variations in Segment 5 cross streams which support redband trout except for Variations S5-A1 and S5-A2. Excluding Variations S5-A1 and S5-A2, the percentage of B2H Project impacts on redband trout occupied streams range from 3.4 to 5.7 percent, with Variation S5-B1 resulting in the greatest percentage of B2H Project impact.

Protected Fish Habitats

Segment 5 does not cross any streams which support protected fish habitats.

Segment 6—Treasure Valley

As described in Section 3.2.5, impacts on fish and fish resources from the B2H Project could mainly occur from the construction of new access roads, the upgrade of existing access roads, and the clearing of riparian vegetation.

Permanent impacts on fish and fish resources would include loss of tall riparian vegetation and altered predator-prey relationships, and may include a localized increase to stream temperature by reducing shade producing capability. Temporary impacts would include short-term increase in turbidity from upland sediment transport to waterways and short-term reduction in water quality due to herbicide drift and runoff.

Several past and present actions in the CIAA are likely to have similarly affected fish and fish resources through removal of streamside vegetation, construction of impervious surfaces that may increase the transport of untreated stormwater directly to waterways, and disturbances to soils. Construction of several RFFAs in the CIAA could result in similar cumulative effects on fish and fish resources, though it is assumed these projects would take steps to avoid, minimize, and mitigate potential impacts on fish and fish resources. A summary of past and present actions for Segment 6 include:

- Mining operations
- Construction of transmission lines
- Transportation corridor construction and maintenance (e.g., roads and railroads)
- Agricultural operations and livestock grazing
- Residential development/structures
- Vegetation management
- Wildfires

A summary of RFFAs for Segment 3 include:

- Vegetation management

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes in Segment 5 would contribute to and increase the cumulative impacts on fish and fish resources (refer to Table 3-742). Table 3-708 summarizes the extent of the stream resources in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from

implementation of the B2H Project, and the amount of B2H Project disturbance relative to total anticipated cumulative disturbance.

Table 3-742. Cumulative Effects Summary for Redband Trout Occupied Streams in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	5,018	203	0	19	222	4,795	8.6
Variation S6-A1	*1,848*	*71*	*0*	*3*	*74*	*1,774*	*4.2*
Variation S6-A2	*1,848*	*71*	*0*	*2*	*73*	*1,775*	*3.3*
Variation S6-B1	*2,356*	*94*	*0*	*10*	*104*	*2,251*	*9.8*
Variation S6-B2	*2,356*	*94*	*0*	*8*	*102*	*2,253*	*7.9*

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Federally Listed and Candidate Fish Species and Associated Habitats

Segment 6 does not cross any streams which support federally listed or candidate fish species.

Sensitive Fish Species

All alternatives and variations in Segment 6 cross streams which support redband trout. The percentage of B2H Project impacts on redband trout occupied streams range from 3.3 to 9.8 percent, with Variation S6-A2 resulting in the lowest impacts at 3.3 percent and Variation S6-B1 resulting in the highest impacts at 8.9 percent.

Protected Fish Habitats

Segment 6 does not cross any streams which support protected fish habitats.

3.3.3.6 LAND USE

This section estimates cumulative effects on land uses (including existing land use, timber management, fire management, zoning, MTRs and special-use airspace, and specially designated areas) from the B2H Project effects in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.6.

The cumulative effects analysis for land uses (including existing land use, timber management, fire management, zoning, MTRs and special-use airspace, and specially designated areas) considers direct and indirect impacts from the B2H Project (described in Section 3.2.6) in conjunction with the past and present actions and RFFAs listed in Table 3-639 and Table 3-640.

For the special designations discussed, a percentage of the incremental B2H Project impact is provided if applicable. This percentage was calculated using the acreage of incremental project disturbance,

divided by the total available resource acreage (including existing and RFFA anticipated development), resulting in the percentage of B2H Project impact, as listed in the tables in each section below.

A qualitative discussion regarding potential cumulative effects is presented for existing land use, timber management, fire management, zoning, and MTRs and special-use airspace. No quantitative analysis was conducted for these resources. The projects that make up the existing conditions for existing land use (Section 3.2.6) are being used in the analysis as the past and present actions for all other resource cumulative analyses. Therefore, quantitative analysis is not applicable for existing land use. Because quantitative impacts are based on surface disturbance, using this kind of approach for Military Training Areas would not accurately represent the nature of the impacts on special-use airspace. Therefore, a qualitative discussion is more appropriate for military training. For timber management, fire management, and zoning, data used for cumulative effects analysis purposes for these resources is more accurately described in qualitative terms due to quantitative data limitations. For example, fire management can be considered in the context provided by historical fires, but no predictions can be made about future fire occurrences. Although increased human activity tends to increase overall fire risk, this also cannot be feasibly quantified. In general, where land uses or other effects are allowable but are not currently taking place or are not reasonably foreseeable in extent, a qualitative analysis is appropriate.

In addition, geospatial information was not available for all projects considered as an RFFA, see Table 3-640. In some cases, these projects are underway in the CIAA; however, geospatial data was not available at the time of data collection for the B2H Project. These projects are believed to be compatible with the B2H Project. In addition, the Applicant would be required to coordinate with the city or jurisdictional agency to obtain necessary permits to ensure compliance with existing land uses, ordinances and policy.

Issues Identified for Analysis

Existing Land Use

Potential cumulative effects on existing residential, commercial, and industrial land uses could result from the incremental impacts associated with the construction and operation of the B2H Project, when considered with past, present and RFFAs. Potential cumulative effects could include incremental increases in restrictions of access or uses on lands within the B2H Project CIAA; or incremental increases in physical conflicts with existing residential, commercial, industrial, or public facilities resulting from further utility development within the CIAA.

Timber Management

Potential cumulative effects on timber management could result from the incremental impacts associated with the construction and operation of the B2H Project, when considered with past, present and RFFAs. Potential cumulative effects could include removal of lands from timber production and constraints on the methods of timber harvest.

Fire Management

Potential cumulative effects on fire management could result from the incremental impacts associated with the construction and operation of the B2H Project, when considered with past, present and RFFAs. Potential cumulative effects are related to increases in the risk of fire ignitions through increased human presence and public access, constraints on fire suppression activities, and through potential vegetation change such as right-of-way management and the spread of invasive plants.

Zoning

Potential cumulative effects on zoning could result from the incremental impacts associated with the construction and operation of the B2H Project, when considered with past, present and RFFAs. Potential cumulative effects could include incremental increases in amendments to comprehensive plans, or issuances of conditional use permits for land uses that are considered compatible, but cumulatively could unintentionally result in zoning character or pattern changes within the CIAA.

Military Training

Potential cumulative effects from the B2H Project on military training would include incremental development on lands within the boundaries of the special-use airspace areas that is not compatible with military training operations. The impacts would be intensified where past and/or present actions have already affected an area or where a RFFA is proposed in the same area.

Specially Designated Areas

Potential cumulative effects from the B2H Project on specially designated lands like areas of critical environmental concern, research natural areas, and wildlife areas include crossing areas that prohibit future transmission lines from crossing them and crossing specially designated areas that are exclusion or avoidance areas for future utility development. These impacts would be intensified where other past and/or present actions have already affected a specially designated area or where a RFFA is proposed in the same area. The incremental cumulative effects on the specially designated area from the B2H Project, in addition to the past and/or present action or RFFA, could result in the specially designated area not being managed for what it was originally intended.

EXISTING CONDITION

Existing Land Use

The existing condition for existing land use is discussed in Section 3.2.6.5. Past and present actions occur throughout the B2H Project area and include agriculture, grazing, mining, and general recreation; residential, industrial, and commercial development; transportation and utility corridors; parks and open space; and military installations.

Timber Management

The existing condition for timber management is discussed in Section 3.2.6.5. Past and present actions occur throughout forested portions of the B2H Project area, and include timber harvest and other forestry practices in addition to developments such as agriculture, grazing, mining, and general

recreation; residential, industrial, and commercial development; transportation and utility corridors; parks and open space; and military installations.

Fire Management

The existing condition for fire management is discussed in Section 3.2.6.5. Past and present actions occur throughout the B2H Project area, and developments such as agriculture, grazing, mining, and general recreation; residential, industrial, and commercial development; transportation and utility corridors; parks and open space; and military installations. Recent historical fires also are analyzed as a part of the existing environment.

Zoning

The existing conditions for zoning are discussed in Section 3.2.6.5. Past and present actions occur throughout the B2H Project area and include federal land use and resource management plans, Statewide local planning goals and local comprehensive plans and zoning ordinances.

Military Training

The existing condition for military training is discussed in Section 3.2.6.5, Land Use Affected Environment. Past and/or present actions generally occur on almost all areas overlapped by military training air space used for military training operations. The natural environment has been altered to allow for these past and/or present actions such as infrastructure, roads, pipelines, oil and gas development, mines, transmission lines, etc., but is still compatible with NWSTF Boardman training mission.

Specially Designated Areas

The existing condition for specially designated areas is discussed in Section 3.2.6.5. Past and/or present actions generally occur on almost all specially designated areas in the geographic scope. The natural environment has been altered to allow for these past and/or present actions such as recreational infrastructure, roads, pipelines, mines, transmission lines, etc., but is still compatible with the natural feature or use which the specially designated area was designated.

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

Existing Land Use

Existing land uses described in Section 3.2.6.5 reflect the baseline conditions in the B2H Project study corridor. In this analysis, the baseline conditions are considered the past and present actions that have or are occurring within the CIAA. Existing land uses within the CIAA consist of linear developments such as roads, railroads, pipelines and electrical transmission and generation facilities. Other existing land uses consist of large areas of commercial agricultural facilities, scattered residential areas, commercial and industrial areas (typically located near Interstate 84), oil and gas developments, energy developments such as numerous wind farms in Morrow and Umatilla counties south of the NWSTF Boardman, and open space and recreational areas.

The predominant existing pattern of land use within Segment 1 is agriculture (ranching and farming). RFFAs have been identified and primarily consist of future renewable wind-energy developments and ancillary facilities, and oil and gas developments. Typically, these RFFAs would not interfere with existing agricultural activities and are generally considered compatible lands uses. Although the proposed B2H Project also is generally compatible with existing land uses, when combined with the past and present actions, the B2H Project and RFFAs would incrementally continue the conversion of agricultural lands to other developed land uses. Locations of the B2H Project alternatives and RFFAs near, adjacent to and in areas south of the NWSTF Boardman could cumulatively concentrate agricultural land conversions in these areas; however, these potential cumulative impacts would not interfere with or predominantly alter the existing land-use patterns of agricultural activities from occurring in the CIAA. Therefore, the potential cumulative impacts on agricultural land uses are not considered significant. Refer to Section 3.3.3.7 for discussion of cumulative impacts on Agriculture.

Although the B2H Project does not cross existing residential developments, it would cross in proximity to scattered residences in rural areas primarily associated with working agricultural lands. If construction of the B2H Project is concurrent or adjacent in time to other RFFAs, then scattered residences located in proximity to the RFFA renewable energy developments and the B2H Project (primarily in Morrow and Umatilla counties) could experience short-term cumulative impacts due to increases in local traffic. These short-term cumulative impacts could potentially limit and/or alter access to existing residences and produce noise during construction of the projects. These cumulative impacts could be minimized through coordination of construction activities and are therefore not anticipated to be significant.

Timber Management

The B2H Project would not cross any forested lands in Morrow County, and would not contribute to cumulative effects on timber management. Refer to Section 3.3.3.7 for a discussion related to cumulative effects on tree farms in Morrow County. Forested lands are present in Umatilla County, although no areas zoned as a timber-related classification would be crossed by the B2H Project. All alternative routes for the B2H Project cross lands zoned as “Timber Grazing A-4” in Union County, although the Wallowa-Whitman National Forest LRMP would take precedence over zoning classifications on the national forest.

The B2H Project in addition to other ground-disturbing past and present actions and other RFFAs would contribute to the loss of vegetation where it is constructed. Where forested vegetation is present, this would contribute cumulatively to a long-term reduction of areas currently suitable for timber growth and harvest. Because no areas are currently zoned as a timber-related classification, cumulative impacts on timber management are not expected to be significant.

Fire Management

The B2H Project and ground-disturbing present actions, and other RFFAs would contribute to changes in the landscape that have altered historical fire regimes, and will continue to do so in the future. Nearly any human activity has the potential to increase the risk of fire ignition, contribute to the spread of invasive plants that alter fire regimes, cause ground disturbance that alters local fire behavior, or create

infrastructure or other values that require fire suppression efforts for protection in the event of a fire. This has resulted in a landscape where fires ignite in a greater range of seasons and locations than in the past, and where the expanded wildland-urban interface creates challenges and needs for fire suppression over large areas. The creation of new infrastructure, such as the B2H Project, would continue the trend of an expanding human footprint and wildland-urban interface where fire suppression needs are the greatest and the most challenging.

Zoning

Zoning described in Section 3.2.6.5 reflects the baseline conditions in the B2H Project area. Primarily, areas crossed by alternatives in Segment 1 of the B2H Project are zoned for agriculture (ranching and farming). Residential, commercial, industrial and public/quasi-public zones also are crossed by the B2H Project alternatives.

To protect working agricultural and ranching lands, protective zoning categories of EFU and ERU were designated for the majority of the agricultural zones within Segment 1 of the B2H Project. As described in Section 3.2.6.2, EFU and ERUs were developed to protect farming and ranching landscapes from non-compatible land uses, encroachment, and the subdivision of agricultural parcels. Existing development and RFFAs within zones crossed by Segment 1 alternatives are described above (refer to 3.3.4.6 Existing Land Uses). Similar to the B2H Project, the renewable energy developments identified as RFFAs would need conditional use permits within the EFU or ERU zones. Although individually these projects are permittable within EFU and ERU zones, incremental issuance of conditional use permits for land uses that are not primarily for agriculture could unintentionally change the pattern of land uses within these protected zones. Locations of the B2H Project alternatives and RFFAs near, adjacent to and in areas south of the NWSTF Boardman could cumulatively concentrate agricultural land conversions in these areas; however, these potential cumulative impacts would not interfere with or predominantly alter the existing land-use patterns of agricultural activities from occurring in the CIAA. Therefore the cumulative impacts are not considered significant.

No cumulative impacts have been identified to residential, commercial, industrial and public/quasi-public zones crossed by Segment 1 of the B2H Project.

Military Training

RFFAs that would affect military training in special-use airspace would be limited to transmission lines, communication towers, wind farm development, and any other development taller than 100 feet. Each new above-ground utility project would represent a hazard for aviators to avoid and could pose a compatibility issue with regards to airspace use. However, development within special-use airspace is subject to obstruction evaluation/airport airspace analysis in coordination with the FAA. Therefore, the B2H Project and RFFAs would meet the requirements of NWSTF Boardman and FAA to avoid conflicts with training operations, loss of airspace usability, or conflict with routine activities. Long-term cumulative impacts would be expected as future utility (transmission lines and wind farms) development could affect a percentage of available low-level airspace in the region.

Past and present actions occurring within Military Training Areas:

- Transmission lines
- Communication towers
- Wind Development

The RFFAs proposed or planned within Military Training Areas for Segment 1 include:

- Transmission lines
- Communication towers
- Wind Development

Short-term cumulative impacts from the B2H Project to military training in special-use airspace would occur during the construction phase of the B2H Project and RFFAs. The presence of construction equipment may result in a decrease of available airspace during the construction period. Construction equipment, such as cranes 100 feet tall and taller, may require review via FAA obstruction evaluation/airport airspace analysis process and coordination with military training schedules to inform pilots that will be conducting training. However, these conflicts or restrictions would be temporary and normal training operations would continue once construction is complete.

Specially Designated Areas

Table 3-743 presents a summary of cumulative effects for specially designated areas in Segment 1.

Table 3-743. Cumulative Effects Summary for Specially Designated Areas in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Research Natural Areas							
Applicant's Proposed Action	292	17	0	0	17	274	<1
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	0	0	0	0	0	0	0
Applicant's Proposed Action – Southern Route	292	17	0	0	17	274	<1
West of Bombing Range Road – Southern Route	292	17	0	0	17	274	<1
Longhorn	0	0	0	0	0	0	0

Table 3-743. Cumulative Effects Summary for Specially Designated Areas in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	0	0	0	0	0	0	0
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	0	0	0	0	0	0	0
Area of Critical Environmental Concern							
There are no ACECs present in Segment 1.							
Wildlife Areas							
There are no wildlife areas present in Segment 1.							

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Areas of Critical Environmental Concern

There are no ACECs present in the Segment 1 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

Research Natural Areas

The percentage of the B2H Project in the RNA B on the NWSTF Boardman would be less than 1 percent for all B2H Project alternatives in this segment.

Past and present actions occurring in the RNA B include:

- Northwest Corporation Transmission Line and other transmission lines (owners unknown)
- Existing roads

The short-term cumulative effects of the B2H Project for all alternatives in Segment 1, in addition to past and present actions listed above, would include increased noise from construction equipment, limitation on access to portions of the RNA during construction, and disturbance of land in the right-of-way. Long-term cumulative effects would include potential for additional development to be sited in the same corridor as the B2H Project and potential limitation on the management and use of the RNA.

There are no RFFAs proposed or planned in the RNA B.

Wildlife Areas

There are no past and present actions or RFFAs identified in the Coyote Springs Wildlife Area.

Although the Coyote Springs Wildlife Area is in the Segment 1 CIAA geographic scope, it is not crossed by the B2H Project right-of-way. It is anticipated there would be no cumulative effects on this wildlife area from the B2H Project.

Segment 2—Blue Mountains

Existing Land Use

Existing land uses described in Section 3.2.6.5 reflect the baseline conditions in the B2H Project study corridor. These baseline conditions are considered the past and present actions that have or are occurring within the CIAA. Existing land uses within the CIAA consist of linear developments such as roads, railroads, pipelines and electrical transmission and generation facilities. Other existing land uses consist of areas of commercial agricultural facilities, residential areas, commercial and industrial areas, mining claims, and open space and recreational areas. Cumulative effects on existing agricultural, rural residential and recreational land uses in Segment 2 would generally be the same as those described for Segment 1.

In addition, Malheur County is experiencing growth in the solar industry. As of the publication of the Draft EIS, six solar projects being constructed within the CIAA. No geospatial data has been provided by the Applicant or Malheur County. Malheur County indicated that projects range from 6-10 MW and would consist of 40 to 100 acres depending on project size, area topography and slope (Scott 2016). While these projects are believed to be compatible with the B2H Project, if not mitigated some effects could include limitations on operations and maintenance activities during construction of the B2H Project. The Applicant would be required to coordinate with the county and obtain necessary permits; therefore, these effects could be avoided or mitigated. The B2H Project is not anticipated to contribute to adverse cumulative effects on the county or project proponents.

The predominant existing pattern of land use within Segment 2 is characterized as vacant and undeveloped land. Past and present activities are present in the CIAA and consist of agricultural activities near the southern end of the segment and existing mining claims in mountainous areas north and south of the segment. Additionally present is a network of paved and unpaved roads. Although the proposed B2H Project also is generally compatible with existing land uses, when combined with the past and present actions, the B2H Project and RFFAs could incrementally continue the conversion of undeveloped vacant lands generally associated with open spaces to other developed land uses. Locations of the B2H Project alternatives would not interfere with or predominantly alter the existing land-use patterns from occurring in the CIAA. Therefore, the potential cumulative impacts on existing land uses within Segment 2 are not considered significant.

As discussed in Section 3.3.2, the Wallowa-Whitman National Forest Land and Resource Management Plan Review indicates that the B2H Project would be located in the proposed management area (MA) 5 (Administrative Areas), including utility corridors. Per the Draft RMP, all of the lands currently designated MA 17 adjacent to the I-84 corridor would be incorporated into the new MA 5. While MA 5 has similar purposes as the current MA 17, the details regarding guidelines and standards are expected to be different and may affect the siting of the B2H Project.

Timber Management

Cumulative effects on timber management in Segment 2 would be the same as those described for Segment 1 where forested lands are crossed. Additionally, within the Blue Mountains Ecoregion (Segments 2 and 3) the most frequent land use and cover conversions during the 1973 to 2000 time period were the mechanical disturbance of forest by logging and rangeland improvement (generally removal of pinion/juniper vegetation to promote conversion to grasslands). The second most common overall conversion was nonmechanical disturbance of forest by fire and to a significantly lesser degree, to insect damage from the Douglas-fir tussock moth, the western spruce budworm and the mountain pine beetle (Sleeter et al. 2012).

Fire Management

Cumulative effects on fire management in Segment 2 would be the same as those described for Segment 1.

Zoning

Primarily, areas crossed by alternatives in Segment 2 of the B2H Project are zoned for Timber/Grazing.

Existing development and RFFAs within Timber/Grazing zones crossed by Segment 2 alternatives are described above (refer to 3.3.4.6 Existing Land Uses). Incremental issuance of conditional use permits for land uses that are not primarily for Timber/Grazing could unintentionally change the pattern of land uses or conflict with Timber/Grazing activities. Locations of the B2H Project alternatives and RFFAs within Segment 2 could cumulatively concentrate conditional use development within the CIAA; however, these potential cumulative impacts would not interfere with or predominantly alter the existing land-use patterns of Timber/Grazing activities from occurring in the CIAA. Therefore the cumulative impacts are not considered significant.

No cumulative impacts have been identified to residential, commercial, industrial and public/quasi-public zones crossed by Segment 2 of the B2H Project.

Military Training

Cumulative effects on military training in Segment 2 would be the same as those described for Segment 1.

Specially Designated Areas

Table 3-744 presents a summary of cumulative effects for specially designated areas in Segment 2.

Table 3-744. Cumulative Effects Summary for Specially Designated Areas in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wildlife Areas							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-F1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-F2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Glass Hill	0	0	0	0	0	0	0
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	5,462	269	0	23	292	5,170	<1

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Areas of Critical Environmental Concern

There are no ACECs present in the Segment 2 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

Research Natural Areas

There are no RNAs present in the Segment 2 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

Wildlife Areas

The Mill Creek Alternative crosses the Ladd Marsh Wildlife Area. The percent contribution of the B2H Project to cumulative effects on the Ladd Marsh Wildlife Area would be less than 1 percent. Mitigation measures set forward for the B2H Project and identified by ODFW (identified as part of the state permitting process) would avoid or minimize potential effects on Ladd Marsh. Therefore, the management of the area for the established objectives would not be precluded. While temporary disturbance to sensitive soils, wildlife, and vegetation during construction is anticipated, no long-term

cumulative effects are anticipated to the management of the Ladd Marsh Wildlife Area. Potential effects related to wildlife are discussed in 3.3.4.4.

Past and present actions occurring in the Ladd Marsh Wildlife Area include:

- Active mines (aggregate/mineral)
- Non-residential development
- Pipelines
- Roads
- Transmission lines
- Communication towers

There are no RFFAs proposed or planned in the Ladd Marsh Wildlife Area.

Segment 3—Baker Valley

Existing Land Use

The predominant existing pattern of land use within Segment 3 is characterized as vacant and undeveloped land. Existing developed land uses within the CIAA for Segment 3 consist of linear developments such as roads, railroads, pipelines and electrical transmission and generation facilities. Other existing developed land uses consist of areas of commercial agricultural facilities, residential areas, commercial and industrial areas, mining claims, and open space and recreational areas.

Therefore cumulative effects on land uses in Segment 3 would generally be the same as those described for Segment 2.

Timber Management

Cumulative effects on timber management in Segment 3 would generally be the same as those described for Segment 2 where forested lands are crossed. In Baker County, areas identified for timber production would be crossed by the B2H Project. However, the impacts of the B2H Project would not affect the programmed harvest level for the Wallowa-Whitman National Forest, and the cumulative impact would not be significant.

Fire Management

Cumulative effects on fire management in Segment 3 would be the same as those described for Segment 1.

Zoning

Primarily, areas crossed by alternatives in Segment 3 of the B2H Project are zoned for agricultural and ranching activities.

Existing development and RFFAs within agricultural and ranching zones crossed by Segment 3 alternatives are described above (refer to 3.3.4.6 Existing Land Uses). Incremental issuance of conditional use permits for land uses that are not primarily for agriculture could unintentionally change the pattern of land uses or conflict with agricultural and ranching activities. Locations of the B2H Project

alternatives and RFFAs within Segment 3 could cumulatively concentrate conditional use development within the CIAA; however, these potential cumulative impacts would not interfere with or predominantly alter the existing land-use patterns of agricultural and ranching activities from occurring in the CIAA. Therefore the cumulative impacts are not considered significant.

No cumulative impacts have been identified to residential, commercial, industrial and public/quasi-public zones crossed by Segment 3 of the B2H Project.

Cumulative effects on Zoning in Segment 3 would be the same as those described for Segment 1.

Military Training

Cumulative effects on military training in Segment 3 would be the same as those described for Segment 1.

Specially Designated Areas

Table 3-745 presents a summary of cumulative effects for specially designated areas in Segment 3.

Table 3-745. Cumulative Effects Summary for Specially Designated Areas in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Magpie Peak Area of Critical Environmental Concern (potential future)							
Applicant's Proposed Action	574	7	0	28	35	539	5
Variation S3-A1	*574*	*7*	*0*	*26*	*33*	*541*	*5*
Variation S3-A2	*574*	*7*	*0*	*8*	*15*	*559*	*1*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	574	7	0	28	35	539	5
Timber Canyon	0	0	0	0	0	0	0

Table 3-745. Cumulative Effects Summary for Specially Designated Areas in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Flagstaff A – Burnt River Mountain	574	7	0	28	35	539	5
Flagstaff B	574	7	0	28	35	539	5
Flagstaff B – Burnt River West	574	7	0	9	16	558	2
Flagstaff B - Durkee	574	7	0	30	37	537	5
Virtue Flat Area of Critical Environmental Concern							
Applicant's Proposed Action	42,022	472	0	120	592	41,430	<1
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*42,022*	*472*	*0*	*120*	*592*	*41,430*	*<1*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	0	0	0	0	0	0	0
Timber Canyon	0	0	0	0	0	0	0
Flagstaff A – Burnt River Mountain	0	0	0	0	0	0	0
Flagstaff B	0	0	0	0	0	0	0
Flagstaff B – Burnt River West	0	0	0	0	0	0	0
Flagstaff B - Durkee	0	0	0	0	0	0	0

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Areas of Critical Environmental Concern

The potential future Magpie Peak and Virtue Flat ACECs are present within the Segment 3 CIAA geographic scope.

Past and present actions occurring in these ACEC include:

- Transmission lines
- Active mines (metals, stones)
- Non-residential development
- Roads

There are no RFFAs proposed or planned in the Magpie Peak ACEC. RFFAs identified within the Virtue Flat ACEC include:

- Active mining (aggregate/mineral mining)

The percent contribution of the B2H Project to cumulative effects would be approximately 5 percent for the Magpie Peak ACEC and less than 1 percent for the Virtue Flats ACEC. Mitigation measures set forward for the B2H Project would avoid or minimize potential effects on the management of these ACECs. Therefore, the management of the area and further consideration of all alternatives considered in the Draft Baker RMP/DEIS for the established objectives would not be precluded. While temporary disturbance from noise is anticipated during construction, no effects are anticipated to the management of either the Magpie Peak ACEC or Virtue Flats ACEC. The Oregon Trail ACEC is discussed in Section 3.3.3.12 and 3.3.3.15.

Research Natural Areas

There are no RNAs present in the Segment 3 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

Wildlife Areas

There are no wildlife management areas present in the Segment 3 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

Segment 4—Brogan

Existing Land Use

The predominant existing pattern of land use within Segment 4 is characterized as vacant and undeveloped land. Existing developed land uses within the CIAA for Segment 4 consist of linear developments such as roads, railroads, pipelines and electrical transmission and generation facilities. Other existing developed land uses consist of areas of commercial agricultural facilities, residential areas, commercial and industrial areas, mining claims, and open space and recreational areas.

Therefore cumulative effects on land uses in Segment 4 would generally be the same as those described for Segment 2.

Timber Management

There is no timber resource present within Segment 4 of the B2H Project cumulative impact area. Therefore, no cumulative effects are anticipated.

Fire Management

Cumulative effects on fire management in Segment 4 would be the same as those described for Segment 1.

Zoning

Cumulative effects on Zoning in Segment 4 would be similar as those described for Segment 3.

Military Training

Cumulative effects on military training in Segment 4 would be the same as those described for Segment 1.

Specially Designated Areas

The Oregon Trail—Birch Creek and Tub Mountain ACECs are located near the Tub Mountain South Alternative, as discussed in Section 3.2.6.5 and 3.2.6.6. There are no other specially designated areas present in the Segment 4 CIAA geographic scope. While temporary disturbance from noise is anticipated during construction, no cumulative effects are anticipated to the management of these ACECs.

Segment 5—Malheur

Existing Land Use

The predominant existing pattern of land use within Segment 5 is characterized as vacant and undeveloped land. Existing developed land uses within the CIAA for Segment 5 consist of linear developments such as roads, railroads, pipelines and electrical transmission and generation facilities. Other existing developed land uses consist of areas of commercial agricultural facilities, residential areas, commercial and industrial areas, mining claims, and open space and recreational areas. Therefore cumulative effects on land uses in Segment 5 would generally be the same as those described for Segment 2.

In addition, City of LaGrande indicated that a water storage reservoir and a water treatment plant are planned for in the southern portion of the city. However, no geospatial information is available for these projects. While these projects are believed to be compatible with the B2H Project, if not mitigated some effects could include possible limitations on project siting, operations and maintenance activities during construction of the B2H Project. The Applicant would be required to coordinate with the city and obtain necessary permits. Therefore, these effects could be avoided or mitigated and the B2H Project is not anticipated to contribute to adverse cumulative effects on the city.

Timber Management

There is no timber resource present within Segment 5 of the B2H Project cumulative impact area. Therefore, no cumulative effects are anticipated.

Fire Management

Cumulative effects on fire management in Segment 5 would be the same as those described for Segment 1.

Zoning

Cumulative effects on Zoning in Segment 5 would be similar as those described for Segment 3.

Military Training

Cumulative effects on military training in Segment 5 would be the same as those described for Segment 1.

Specially Designated Areas

Table 3-746 presents a summary of cumulative effects for specially designated areas in Segment 5.

Table 3-746. Cumulative Effects Summary for Specially Designated Areas in Segment 5—Malheur Area in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Owyhee Below the Dam Flat Area of Critical Environmental Concern							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Malheur S	11,217	216	0	28	244	10,972	<1
Malheur A	11,217	216	0	50	266	10,950	<1

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Areas of Critical Environmental Concern

The Owyhee Below the Dam is present within the Segment 5 CIAA geographic scope. Past and present actions occurring in Owyhee River Below the Dam ACEC includes:

- Transmission lines
- Campground
- Communication towers
- Non-residential development
- Roads

There are no RFFAs proposed or planned in the Owyhee River Below the Dam ACEC.

The percent contribution of the B2H Project to cumulative effects on the Owyhee River Below the Dam ACEC would be less than 1 percent. Mitigation measures set forward for the B2H Project would avoid

or minimize potential effects on the management of this ACEC. This ACEC is identified as an avoidance area for new rights-of-way in the Southeastern Oregon RMP. Thus, granting rights-of-way within this area should be avoided to the extent possible. However, new rights-of-way may be granted if there is minimal conflict with identified resource values and impacts can be mitigated. Therefore, the management of the area for the established objectives would not be precluded. While temporary disturbance to sensitive soils, wildlife, and vegetation during construction is anticipated during construction, no effects are anticipated to the management of the Owyhee River Below the Dam ACEC. Potential effects on visual resources and recreation are discussed in Sections 3.3.3.8 and 3.3.3.12.

Research Natural Areas

There are no RNAs present in the Segment 5 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

Wildlife Areas

There are no wildlife management areas present in the Segment 5 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

Segment 6—Treasure Valley

Existing Land Use

The predominant existing pattern of land use within Segment 6 is characterized as vacant and undeveloped land. Existing developed land uses within the CIAA for Segment 6 consist of linear developments such as roads, railroads, pipelines and electrical transmission and generation facilities. Other existing developed land uses consist of areas of commercial agricultural facilities, residential areas, commercial and industrial areas, mining claims, and open space and recreational areas.

Therefore cumulative effects on land uses in Segment 6 would generally be the same as those described for Segment 2.

Timber Management

There is no timber resource present within Segment 6 of the B2H Project cumulative impact area. Therefore, no cumulative effects are anticipated.

Fire Management

Cumulative effects on fire management in Segment 6 would be the same as those described for Segment 1.

Zoning

Cumulative effects on Zoning in Segment 6 would be the similar as those described for Segment 3.

Military Training

There are no MTRs and special-use airspace areas present within Segment 6 of the B2H Project cumulative impact area. Therefore, no cumulative effects are anticipated.

Specially Designated Areas

There are no specially designated areas present in the Segment 6 CIAA geographic scope. Therefore, no cumulative effects are anticipated.

3.3.3.7 AGRICULTURE

This section estimates cumulative effects on agriculture (including existing agriculture, important farmland and high-value soils, and livestock grazing) from the B2H Project in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.7.

The cumulative effects analysis for agriculture considers direct and indirect impacts from the B2H Project (described in Section 3.2.7) in conjunction with the past and present actions and RFFAs listed in Table 3-639 and Table 3-640.

For each agricultural resource discussed, a percentage of B2H Project impact is provided if applicable. This percentage was calculated using the acreage of B2H Project disturbance, divided by the total available resource acreage, resulting in the percentage of B2H Project impact, as listed in the tables in each section below.

ISSUES IDENTIFIED FOR ANALYSIS

Existing Agriculture

Potential cumulative effects on existing agriculture could result from the incremental impacts associated with the construction and operation of the B2H Project, when considered with past, present and RFFAs. Potential cumulative effects include:

- Incremental increases in permanent occupation of active agricultural land by transmission structures.
- Construction of a new transmission line where one currently does not exist may promote the further development of utilities along the corridor.
- Growth-inducing effects.
- Irreversible conversion of agricultural land to nonagricultural uses, which may result in conflicts with surrounding agricultural operations.

When land is converted to non-farm uses due to other types of development, it may be more difficult for surrounding agricultural operations to continue to function as such because of incompatible land uses, nuisance complaints from surrounding nonagricultural land uses, processing facilities supporting agriculture no longer able to economically function, and escalating land prices. Because of the type of project this is (i.e., transmission line project as opposed to a commercial or residential development), it is not expected that farmland conversion from development will escalate as a result of this B2H Project (Department of Environmental Conservation n.d.).

A long-term, indirect impact on irrigated farmland is the potential for creating a utility corridor where one does not previously exist. Oregon law promotes siting new transmission lines where transmission lines

currently exist. There is the potential that with construction of the B2H Project along any alternative, future transmission lines could be colocated with this transmission line, further affecting existing agriculture.

When this potential impact is considered with the potential impact of incremental increases of development on existing agriculture, the impact could be increased. For instance, an initial project constructed might span, as mitigation to avoid or reduce impacts, most irrigated agriculture, such as pivot fields, with minimal impacts. But because of offset requirements by future, colocated transmission projects, it might be more difficult for future projects to follow existing transmission projects and still span pivot irrigation fields. Also, structure footprints could affect entire irrigation systems resulting in greater impacts and potentially making agriculture land between colocated transmission lines unusable.

New infrastructure associated with the B2H Project, such as roads, utility lines, or stations, potentially could be growth inducing (i.e., development that may attract new development and promote growth). For instance, other energy projects such as wind farms, could find this location more appealing for development because infrastructure would be in place for them to tie into the grid, which could have the potential to further intensify the rate at which active agricultural land is converted to nonagricultural uses (Department of Environmental Conservation n.d.).

Design features and selective mitigation measures, such as reclaiming all roads created during construction, would reduce these potential impacts.

Important Farmland, High-Value Soils, and CRP Lands

Potential impacts on important farmland, high-value soils, and CRP lands would be similar to those discussed in this section for existing agriculture. The B2H Project has the potential to intensify the conversion of soils important to crop production (such as those considered important farmland and high-value soils).

Livestock Grazing

Potential cumulative impacts on grazing allotments include crossing of grazing allotments and potential incompatible uses associated with management of these areas. These impacts would be intensified where other existing actions have already affected the grazing allotment or an RFFA is proposed in the same area.

Existing Condition

The existing condition for agriculture is discussed in Section 3.2.7. Past and present actions generally occur on many agricultural lands in the geographic scope. The use of agricultural lands has been altered to allow for these past and/or present actions, such as roads, pipelines, mines, and transmission lines, etc. However, existing agricultural and livestock grazing lands are largely currently operating as agricultural production and use. Important farmland and high-value soils have been taken out of production by these past and present actions.

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

Existing Agriculture

Table 3-747 and Table 3-748 present a summary of cumulative effects for existing agriculture: irrigated agriculture (center pivot, dryland, flood, and other mechanized) CAFOs and crop production (fallow/idle, field crops, fruit and tree nuts, grass pasture, vegetables, and tree farms) in Segment 1.

Table 3-747. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Center Pivot							
Applicant's Proposed Action	2,118	71	3	33	108	2,010	1.5
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0.0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0.0*
East of Bombing Range Road	3,380	56	3	105	164	3,215	3.1
Applicant's Proposed Action – Southern Route	1,852	59	3	28	91	1,761	1.5
West of Bombing Range Road – Southern Route	1,390	53	0	19	72	1,318	1.4
Longhorn	2,693	65	6	116	187	2,506	4.3
Interstate 84	3,786	154	0	65	218	3,567	1.7
Variation S1-A1	*417*	*15*	*0*	*2*	*17*	*401*	*<1*
Variation S1-A2	*262*	*1*	*0*	*15*	*17*	*245*	*5.9*
Interstate 84 – Southern Route	3,520	141	0	60	201	3,319	1.7
Dryland							
Applicant's Proposed Action	28,015	377	66	623	1,066	26,949	2.2
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	27,064	326	66	630	1,022	26,043	2.3
Applicant's Proposed Action – Southern Route	30,172	413	66	658	1,137	29,035	2.2
West of Bombing Range Road – Southern Route	16,368	331	58	335	725	15,643	2.0
Longhorn	20,926	223	48	498	770	20,157	2.4

Table 3-747. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	9,718	194	0	250	444	9,274	2.6
Variation S1-A1	*4,082*	*132*	*0*	*59*	*191*	*3,892*	*1.4*
Variation S1-A2	*1,143*	*69*	*0*	*52*	*121*	*1,022*	*4.5*
Interstate 84 – Southern Route	13,187	238	0	285	522	12,665	2.2
Flood							
Applicant's Proposed Action	862	32	0	32	64	799	3.7
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	862	32	0	32	64	799	3.7
Applicant's Proposed Action – Southern Route	835	30	0	17	47	789	2.1
West of Bombing Range Road – Southern Route	108	6	0	3	8	99	2.5
Longhorn	862	32	0	33	64	798	3.8
Interstate 84	1,030	52	0	41	93	937	4.0
Variation S1-A1	*44*	*<1*	*0*	*4*	*4*	*39*	*8.0*
Variation S1-A2	*63*	*6*	*0*	*7*	*13*	*50*	*11.5*
Interstate 84 – Southern Route	1,030	52	0	42	93	936	4.0
Other Mechanized							
Applicant's Proposed Action	482	20	0	14	34	448	2.8
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	1,296	36	0	56	92	1,204	4.3
Applicant's Proposed Action – Southern Route	487	13	0	13	26	461	2.6
West of Bombing Range Road – Southern Route	693	25	0	21	46	648	3.1
Longhorn	8,329	136	0	36	172	8,157	<1
Interstate 84	259	27	0	10	37	222	4.0
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*148*	*9*	*0*	*8*	*17*	*131*	*5.5*

Table 3-747. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84 – Southern Route	264	19	0	9	29	235	3.6

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-748. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Confined Animal Feeding Operations[1]							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	0	0	0	0	0	0	0
Applicant's Proposed Action – Southern Route	0	0	0	0	0	0	0
West of Bombing Range Road – Southern Route	0	0	0	0	0	0	0
Longhorn	1600	84	0	40	125	1475	2.5
Interstate 84	1600	206	0	17	223	1377	1.1
Variation S1-A1	*800*	*72*	*0*	*6*	*79*	*721*	*<1*
Variation S1-A2	*800*	*58*	*0*	*11*	*69*	*731*	*1.4*
Interstate 84 – Southern Route	1600	206	0	17	224	1376	1.1
Fallow/Idle Cropland							
Applicant's Proposed Action	23,252	440	116	180	737	22,516	*<1*
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-748. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 1—Morrow-Umatilla in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
East of Bombing Range Road	23,269	440	116	189	745	22,524	<1
Applicant's Proposed Action – Southern Route	21,293	414	116	146	677	20,616	<1
West of Bombing Range Road – Southern Route	14,756	224	78	178	480	14,276	*1.2*
Longhorn	17,036	325	83	151	559	16,477	*<1*
Interstate 84	7,399	161	0	140	301	7,098	1.9
Variation S1-A1	*3,867*	*88*	*0*	*26*	*114*	*3,753*	<1
Variation S1-A2	*935*	*44*	*0*	*60*	*104*	*831*	*6.4*
Interstate 84 – Southern Route	5,560	137	0	105	242	5,318	1.9
Field Crops							
Applicant's Proposed Action	36,457	517	173	356	1,046	35,411	1.0
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	36,843	504	173	412	1,088	35,755	1.1
Applicant's Proposed Action – Southern Route	37,905	520	173	363	1,056	36,849	1.0
West of Bombing Range Road – Southern Route	16,761	330	84	135	549	16,211	<1
Longhorn	30,602	414	137	325	875	29,727	1.1
Interstate 84	7,733	179	0	126	305	7,428	1.6
Variation S1-A1	*3,820*	*76*	*0*	*33*	*109*	*3,711*	*<1*
Variation S1-A2	*1,023*	*25*	*0*	*21*	*46*	*977*	*2.0*
Interstate 84 – Southern Route	9,199	182	0	142	324	8,874	1.5
Fruit Tree Nuts							
Applicant's Proposed Action	2	<1	0	<1	1	<1	21.7
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-748. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 1—Morrow-Umatilla in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
East of Bombing Range Road	9	<1	0	3	3	5	36.2
Applicant's Proposed Action – Southern Route	2	<1	0	<1	1	<1	22.1
West of Bombing Range Road – Southern Route	2	<1	0	<1	1	<1	23.1
Longhorn	198	<1	0	1	2	197	0.5
Interstate 84	28	<1	0	2	2	26	5.3
Variation S1-A1	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	28	<1	0	2	2	26	5.3
Grass Pasture							
Applicant's Proposed Action	213	2	0	41	44	170	19.4
Variation S1-B1	*5*	*0*	*0*	*3*	*3*	*3*	*48.7*
Variation S1-B2	*13*	*2*	*0*	*2*	*4*	*9*	*15.9*
East of Bombing Range Road	742	10	0	49	59	683	6.6
Applicant's Proposed Action – Southern Route	134	1	0	35	36	98	25.9
West of Bombing Range Road – Southern Route	135	1	0	38	39	96	27.9
Longhorn	371	3	0	45	48	323	12.2
Interstate 84	227	4	0	45	49	178	19.7
Variation S1-A1	*2*	*<1*	*0*	*1*	*1*	*1*	*49.1*
Variation S1-A2	*1*	*<1*	*0*	*0*	*<1*	*<1*	*0*
Interstate 84 – Southern Route	148	3	0	38	41	107	25.7
Vegetables							
Applicant's Proposed Action	907	23	2	6	31	877	<1
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-748. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
East of Bombing Range Road	1,800	28	2	50	80	1,719	2.8
Applicant's Proposed Action – Southern Route	907	23	2	6	31	877	<1
West of Bombing Range Road – Southern Route	795	23	0	2	25	771	<1
Longhorn	1,961	76	2	47	124	1,837	2.4
Interstate 84	1,496	76	0	33	109	1,386	2.2
Variation S1-A1	*97*	*6*	*0*	*0*	*6*	*91*	*0*
Variation S1-A2	*209*	*2*	*0*	*6*	*8*	*201*	*2.8*
Interstate 84 – Southern Route	1,496	76	0	34	110	1,386	2.3
Tree Farms							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	18,080	453	0	41	494	17,586	<1
Applicant's Proposed Action – Southern Route	0	0	0	0	0	0	0
West of Bombing Range Road – Southern Route	0	0	0	0	0	0	0
Longhorn	23,929	545	0	12	557	23,372	<1
Interstate 84	0	0	0	0	0	0	0
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	0	0	0	0	0	0	0

Table Notes:
Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.
[1]It is unknown the exact size of confined animal feeding operations, so an estimate of 800 acres per confined animal feeding operation was used for this analysis.

Several past and present actions in the CIAA, such as wind development, pipelines, transmission lines, and transportation development, are likely to have similarly affected existing agriculture through

permanent occupation of agriculture land by nonagricultural uses. Construction of several RFFAs in the CIAA would result in similar cumulative effects on existing agriculture, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss existing agriculture in the CIAA for Segment 1.

Past and present actions in the CIAA for existing agriculture include:

- Irrigated Agriculture (Center Pivot Irrigation, Dryland, Flood irrigation, and Other mechanized)
  - Perennial Wind Chaser Gas Pipeline, Northwest Corp Pipeline, Cascade Natural Gas Pipeline, and other pipelines of unknown ownership
  - UEC Transmission Line, CBE Transmission Lines, Northwest Corp Transmission Line, and other transmission lines of unknown ownership
  - Service Buttes Wind Turbines
  - FCC and Morrow County Communication Towers and other communication facility
  - Roads, railroads, mining, residences, outstructures, rest stop and other non-residential structures
- Crop Production (Fallow, Field Crops, Fruit and Tree Nuts, Grass Pasture, Vegetables, and Tree Farms) and CAFOs
  - Northwest Corp Pipeline, Cascade Natural Gas Pipeline, Perennial Wind Chaser Gas Pipeline, and other pipelines of unknown ownership
  - Northwest Corp Transmission Line, Oregon Wind Transmission Line, CBE Transmission Lines, UEC Transmission Line, and other transmission lines of unknown ownership
  - Service Buttes Wind Turbines , Oregon Wind Strings Turbines
  - FCC and Morrow County Communication Towers
  - Roads, rest stop, power substation, railroads, mining, residences, outstructures, and other non-residential structures

RFFAs in the CIAA for existing agriculture include:

- Buttercreek Wind Turbines
- Wheatridge Wind Turbines
- Oil and/or Gas Development

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes and route variations in Segment 1 would contribute to and increase the cumulative impacts on all irrigation types, crops, and CAFOs at varying degrees. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of agriculture in the CIAA.

B2H Project implementation would result in the greatest incremental disturbance to field crops and dryland farming for all alternative routes and is expected to contribute up to 2.6 percent of the estimated cumulative development. Incremental disturbance to other crop types, CAFOs, and irrigated agriculture is anticipated to result from B2H Project implementation to similar, but lesser extents. The percent of

B2H Project impact would be highest to fruit and tree nuts (36.2 percent [3 of 9 total acres in the CIAA for this alternative route] on the East of Bombing Range Road Alternative), pivot irrigation (4.3 percent on the Longhorn Alternative), and other mechanized irrigation (4.3 percent East of Bombing Range Road Alternative). Of the alternatives considered in Segment 1, the East of Bombing Range Road Alternative would have the greatest percentage of project impact on fruit and tree nuts, the Longhorn Alternative would have the greatest percentage of project impact on CAFOs, and the West of Bombing Range Road-Southern Route would have the greatest percentage of project impact on grasslands/pasture. Impacts could include escalation of the conversion of agricultural land to nonagricultural uses from growth induced effects, changing land uses making agriculture no longer compatible, and creation of new utility corridors.

Important Farmland, High-Value Soils, and CRP Lands

Table 3-749 and Table 3-750 present a summary of cumulative effects for important farmland and high-value soils in Segment 1. Table 3-749 and Table 3-750 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance. There are no quantitative data available for CRP lands for the entire B2H Project area. Potential cumulative effects on these lands will be discussed qualitatively below.

Table 3-749. Cumulative Effects Summary for Important Farmland in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	88,727	2,102	102	1,223	3,427	85,300	1
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	91,485	2,159	123	1,309	3,590	87,895	1
Applicant's Proposed Action – Southern Route	89,599	2,029	102	1,303	3,433	86,166	1
West of Bombing Range Road – Southern Route	85,008	2,040	109	1,080	3,229	81,780	1
Longhorn	76,202	1,694	104	1,200	2,998	73,204	2

Table 3-749. Cumulative Effects Summary for Important Farmland in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Interstate 84	144,148	4,662	0	797	5,460	138,688	<1
Variation S1-A1	*101,030*	*3,050*	*0*	*172*	*3,222*	*97,808*	*<1*
Variation S1-A2	*19,235*	*1,037*	*0*	*276*	*1,313*	*17,922*	*1*
Interstate 84 – Southern Route	154,892	4,720	0	898	5,619	149,273	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-750. Cumulative Effects Summary for High-Value Soils in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	48,441	874	70	516	1,460	46,981	1
Variation S1-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
East of Bombing Range Road	50,774	918	91	587	1,596	49,178	1
Applicant's Proposed Action – Southern Route	41,086	685	70	440	1,195	39,892	1
West of Bombing Range Road – Southern Route	35,311	750	105	381	1,236	34,075	1
Longhorn	38,055	565	58	438	1,061	36,994	1
Interstate 84	115,729	3,505	0	395	3,900	111,828	<1
Variation S1-A1	*98,292*	*2,836*	*0*	*139*	*2,975*	*95,317*	*<1*
Variation S1-A2	*12,758*	*677*	*0*	*90*	*767*	*11,991*	*<1*
Interstate 84 – Southern Route	118,505	3,445	0	332	3,777	114,728	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as wind development, pipelines, transmission lines, and transportation development, are likely to have similarly affected important farmland and high-value

soils through permanent occupation of agriculture land by nonagricultural uses. Construction of several RFFAs in the CIAA would result in similar cumulative effects on important farmland and high-value soils, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss of important farmland and high-value soils in the CIAA for Segment 1. Past and present actions in the CIAA for important and high-value soils include:

- Northwest Corp Pipeline and other pipelines of unknown ownership
- Northwest Corp Transmission Line, Oregon Wind Transmission Line, UEC Transmission Line, and other transmission lines of unknown ownership
- Oregon Wind Strings Turbines and Service Buttes Wind Turbines
- Madison Farms Solar Project
- FCC Communication Towers and other communication facilities
- Oregon Dams
- Roads, rest stops, , campgrounds, a substation, railroads, mining, residences, outstructures, and other non-residential structures

RFFAs in the CIAA for important and high-value soils include:

- Buttercreek Wind Turbines
- Wheatridge Turbines
- Oil and/or Gas Development

B2H Project implementation would result in the greatest incremental project development to important farmland and high-value soils on the East of Bombing Range Road Alternative. Of the alternatives considered in Segment 1, the Longhorn Alternative would have the greatest percent of project impact on important farmland. All alternatives in Segment 1 would have less than one percent of project impact on high-value soils. Types of impacts would be similar to those discussed under existing agriculture.

Short- and long-term cumulative effects on CRP lands also would be similar to those described in this section for important farmland and high-value soils, but may be further compounded by a reduction in payment a landowner may receive for the CRP lands crossed by multiple types of past and present actions and RFFAs (including the B2H Project).

Livestock Grazing

Table 3-751 and Table 3-752 present a summary of cumulative effects for livestock grazing in Segment 1. These tables summarize the extent of livestock grazing in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-751. Cumulative Effects Summary for Livestock Grazing in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	23,472	466	0	94	561	22,911	<1
Variation S1-B1	*23,472*	*466*	*0*	*101*	*567*	*22,905*	*<1*
Variation S1-B2	*44,678*	*738*	*0*	*73*	*811*	*43,867*	*<1*
East of Bombing Range Road	23,472	466	0	94	561	22,912	<1
Applicant's Proposed Action – Southern Route	23,472	466	0	96	562	22,910	<1
West of Bombing Range Road – Southern Route	23,472	466	0	100	567	22,905	<1
Longhorn	23,472	466	0	96	563	22,910	<1
Interstate 84	34,736	957	0	136	1,093	33,644	<1
Variation S1-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S1-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Interstate 84 – Southern Route	34,736	957	0	137	1,094	33,642	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as wind development, pipelines, transmission lines, and transportation development, are likely to have similarly affected livestock grazing. Construction of several RFFAs in the CIAA would result in similar cumulative effects on livestock grazing, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss to livestock grazing in the CIAA for Segment 1.

Past and present actions in the CIAA for livestock grazing include:

- Northwest Corp Pipeline, Perennial Wind Chaser Gas Pipeline, and other pipelines of unknown ownership
- Oregon Wind Transmission Line and other transmission lines of unknown ownership
- Oregon Wind Farm Turbines
- FCC Communication Towers and other communication facilities
- Roads, railroads, mining, residences, outstructures, and other non-residential structures

RFFAs in the CIAA for livestock grazing include:

- Oil and/or Gas Development
- Active Mining Claims

The percentage of the B2H Project impacts located in grazing allotments for all alternative routes in Segment 1 would be less than 1 percent. The short-term cumulative effects of the B2H Project, in addition to the past and present actions and RFFAs, on livestock grazing would include construction activities that may require the addition of gates to existing fences; construction-related disturbances (e.g., noise from vehicles, equipment, and personnel) associated with development of access roads, site grading, building structures, and larger footprints of disturbance before restoration efforts occur. The long-term cumulative effects would be reduced grazing land available where permanent disturbance would occur from the B2H Project and other actions. The use of the land for grazing purposes is anticipated to continue after construction of the B2H Project is completed.

Segment 2—Blue Mountains

Existing Agriculture

Table 3-752 presents a summary of cumulative effects for crop production (field crops and grass pasture) in Segment 2. Irrigated agriculture, CAFOs, fallow/idle cropland, and vegetable and tree farms are not present in the CIAA in Segment 2; thus, these particular resources are not discussed in this section.

Table 3-752. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Confined Animal Feeding Operations							
There are none present in this segment.							
Fallow/Idle Cropland							
There are none present in this segment.							
Field Crops							
Applicant's Proposed Action	29	<1	0	7	7	22	22.8
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*2*	*0*	*0*	*1*	*1*	*<1*	*63.4*
Variation S2-B2	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S2-C1	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S2-C2	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-752. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*1*	*0*	*0*	*0*	*0*	*1*	*0*
Variation S2-F1	*27*	*<1*	*0*	*5*	*6*	*21*	*20.2*
Variation S2-F2	*3*	*<1*	*0*	*2*	*2*	*1*	*54.1*
Glass Hill	27	<1	0	6	6	21	20.9
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	38	4	0	6	9	29	15.0
Fruit Tree Nuts							
There are none present in this segment.							
Grass Pasture							
Applicant's Proposed Action	<1	0	0	<1	<1	<1	50
Variation S2-A1	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S2-C2	*2*	*0*	*0*	*0*	*0*	*2*	*0*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-F1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-F2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Glass Hill	<1	0	0	<1	<1	<1	50
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	2	0	0	<1	<1	<1	54
Vegetables							
There are none present in this segment.							
Tree Farms							
There are none present in this segment.							

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions in the CIAA, such as transmission lines, are likely to have similarly affected existing agriculture through permanent occupation of agriculture land by nonagricultural uses. There

are currently no RFFAs identified in Segment 2. The past and present projects identified below include those used to quantitatively assess incremental loss to existing agriculture in the CIAA for Segment 2.

Past and present actions in the CIAA for crop production include existing transmission lines, roads, and pipelines. No RFFAs were identified in the CIAA for crop production. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes and route variations in Segment 2 could contribute to and increase the cumulative impacts on crops at varying degrees.

B2H Project implementation would result in the greatest incremental disturbance to field crops and is expected to contribute up to 50 percent (1 of 2 total acres) of the estimated cumulative development of grasslands/pasture and 23 percent (7 of 29 total acres) of the estimated cumulative development of field crops. The Millcreek Alternative would have the least percent of project impact on field crops and all alternatives, but would have the highest percent of project impact on grasslands/pasture. Impacts could include escalation of the conversion of agricultural land to nonagricultural uses from growth induced effects and creation of new utility corridors.

Important Farmland, High-Value Soils, and CRP Lands

Table 3-753 and Table 3-754 present a summary of cumulative effects for important farmland and high-value soils in Segment 2.

Table 3-753. Cumulative Effects Summary for Important Farmland in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	14,156	312	0	393	705	13,451	3
Variation S2-A1	*151*	*2*	*0*	*7*	*9*	*142*	*5*
Variation S2-A2	*49*	*5*	*0*	*5*	*10*	*39*	*9*
Variation S2-B1	*2,554*	*47*	*0*	*37*	*84*	*2,470*	*1*
Variation S2-B2	*2,662*	*68*	*0*	*50*	*117*	*2,545*	*2*
Variation S2-C1	*6,608*	*106*	*0*	*174*	*280*	*6,328*	*3*
Variation S2-C2	*4,375*	*76*	*0*	*129*	*205*	*4,170*	*3*
Variation S2-E1	*1,208*	*7*	*0*	*23*	*31*	*1,177*	*2*
Variation S2-E2	*618*	*19*	*0*	*26*	*44*	*573*	*4*
Variation S2-F1	*4,895*	*172*	*0*	*118*	*290*	*4,606*	*2*
Variation S2-F2	*2,512*	*120*	*0*	*83*	*203*	*2,309*	*3*
Glass Hill	14,775	288	0	398	686	14,089	3
Variation S2-D1	*3,843*	*31*	*0*	*84*	*116*	*3,728*	*2*
Variation S2-D2	3,875	29	0	78	108	3,768	2
Mill Creek	10,426	434	0	348	782	9,644	3

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-754. Cumulative Effects Summary for High-Value Soils in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	1,879	134	0	47	180	1,698	2
Variation S2-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-B2	*82*	*8*	*0*	*2*	*10*	*72*	*2*
Variation S2-C1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-E2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-F1	*1,879*	*134*	*0*	*44*	*178*	*1,701*	*2*
Variation S2-F2	*1,372*	*87*	*0*	*29*	*116*	*1,256*	*2*
Glass Hill	1,879	134	0	46	180	1,699	2
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	1,503	99	0	41	140	1,363	3

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as pipelines, transmission lines, and transportation development, are likely to have similarly affected important farmland and high-value soils through permanent occupation of agriculture land by nonagricultural uses. There are no existing RFFAs in Segment 2. The past and present projects identified below include those used to quantitatively assess incremental loss of important farmland and high-value soils in the CIAA for Segment 2. Past and present actions and RFFAs in the CIAA for important and high-value soils include:

- FCC Communication Towers
- Roads, pipelines, outstructures, a campground, substations, railroads, transmission lines, mining, residences, School/Educational Facilities, and other non-residential structures

No RFFAs were identified in the CIAA for important and high-value soils.

B2H Project implementation would result in the greatest incremental project development to important farmland and high-value soils on the Glass Hill Alternative. All alternatives considered in Segment 2, would have the same percent of project impact on important farmland and high-value soils (3 percent). Types of impacts would be similar to those discussed under existing agriculture.

Livestock Grazing

Table 3-755 presents a summary of cumulative effects for livestock grazing in Segment 2. Table 3-755 summarizes the extent of livestock grazing in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-755. Cumulative Effects Summary for Livestock Grazing in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	68,378	1,353	0	253	1,605	66,773	<1
Variation S2-A1	*22,111*	*378*	*0*	*27*	*405*	*21,706*	*<1*
Variation S2-A2	*22,111*	*378*	*0*	*53*	*431*	*21,680*	*<1*
Variation S2-B1	*2,401*	*22*	*0*	*17*	*39*	*2,361*	*<1*
Variation S2-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-C1	*10,855*	*169*	*0*	*47*	*216*	*10,639*	*<1*
Variation S2-C2	*11,097*	*172*	*0*	*60*	*232*	*10,865*	*<1*
Variation S2-E1	*15,412*	*372*	*0*	*19*	*391*	*15,021*	*<1*
Variation S2-E2	*4,557*	*203*	*0*	*32*	*235*	*4,322*	*<1*
Variation S2-F1	*33,012*	*784*	*0*	*91*	*874*	*32,138*	*<1*
Variation S2-F2	*33,012*	*784*	*0*	*125*	*908*	*32,104*	*<1*
Glass Hill	68,378	1,353	0	269	1,622	66,756	<1
Variation S2-D1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S2-D2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Mill Creek	55,123	1,162	0	228	1,390	53,733	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as pipelines, transmission lines, and transportation development, are likely to have similarly affected livestock grazing. There are no RFFAs affecting livestock grazing in Segment 2. The past and present projects identified below include those used to quantitatively assess incremental loss to livestock grazing in the CIAA for Segment 2.

Past and present actions within the geographic scope for livestock grazing include:

- Pipelines of unknown ownership
- Transmission lines of unknown ownership
- Oregon Dams
- Elkhorn Wind Turbines
- FCC Communication Towers and other communication facilities

- Roads, residential, outstructures, railroads, mining, and non-residential structures

There are no RFFAs identified in the CIAA.

The percentage of the B2H Project impacts located in grazing allotments for all alternative routes in Segment 2 would be less than 1 percent. The Glass Hill Alternative would result in the greatest incremental project development. The short-term cumulative effects of the B2H Project, in addition to the past and present actions and RFFAs, on livestock grazing would include construction activities that may require the addition of gates to existing fences; construction-related disturbances (e.g., noise from vehicles, equipment, and personnel) associated with development of access roads, site grading, building structures, and larger footprints of disturbance before restoration efforts occur. The long-term cumulative effects would be reduced grazing land available where permanent disturbance would occur from the B2H Project and other actions. The use of the land for grazing purposes is anticipated to continue after construction of the B2H Project is completed.

Segment 3—Baker Valley

Existing Agriculture

Table 3-756 and Table 3-757 present a summary of cumulative effects for existing agriculture: irrigated agriculture (center pivot, flood, and other mechanized) and crop production (fallow/idle, field crops, grass pasture, and vegetables) in Segment 3. Table 3-756 and Table 3-757 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-756. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Center Pivot							
Applicant's Proposed Action	117	0	0	4	4	113	3.8
Variation S3-A1	*117*	*0*	*0*	*4*	*4*	*113*	*3.6*
Variation S3-A2	*117*	*0*	*0*	*0*	*0*	*117*	*0*
Variation S3-B1	*117*	*0*	*0*	*0*	*0*	*117*	*0*
Variation S3-B2	*273*	*1*	*0*	*0*	*1*	*272*	*0*
Variation S3-B3	*273*	*1*	*0*	*0*	*1*	*272*	*0*
Variation S3-B4	*117*	*0*	*0*	*0*	*0*	*117*	*0*
Variation S3-B5	*273*	*1*	*0*	*0*	*1*	*272*	*0*
Variation S3-C1	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-756. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	273	1	0	4	5	268	1.6
Timber Canyon	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A – Burnt River Mountain	*273*	*1*	*0*	*4*	*6*	*268*	*1.6*
Flagstaff B	273	1	0	4	5	268	1.6
Flagstaff B – Burnt River West	273	1	0	0	1	272	0
Flagstaff B - Durkee	273	1	0	5	6	267	1.7
Dryland							
There are none present in this segment.							
Flood							
Applicant's Proposed Action	4	0	0	0	0	4	0
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B5	*185*	*4*	*0*	*0*	*4*	*181*	*0*
Variation S3-C1	*4*	*0*	*0*	*0*	*0*	*4*	*0*
Variation S3-C2	*4*	*0*	*0*	*0*	*0*	*4*	*0*
Variation S3-C3	*407*	*23*	*0*	*5*	*29*	*379*	*1.3*
Variation S3-C4	*407*	*23*	*0*	*1*	*24*	*383*	*<1*
Variation S3-C5	*152*	*12*	*0*	*1*	*12*	*140*	*<1*
Variation S3-C6	*174*	*12*	*0*	*3*	*15*	*159*	*1.9*
Flagstaff A	189	4	0	0	4	186	0
Timber Canyon	381	26	0	25	52	330	6.7
Flagstaff A – Burnt River Mountain	592	27	0	5	32	560	<1
Flagstaff B	4	0	0	0	0	4	0

Table 3-756. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Flagstaff B – Burnt River West	152	12	0	<1	12	140	<1
Flagstaff B - Durkee	174	12	0	3	14	160	1.6
Other Mechanized							
Applicant's Proposed Action	142	12	0	6	18	124	3.9
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*313*	*18*	*0*	*<1*	*18*	*295*	*<1*
Variation S3-B3	*313*	*18*	*0*	*<1*	*18*	*295*	*<1*
Variation S3-B4	*536*	*31*	*0*	*23*	*54*	*482*	*4.3*
Variation S3-B5	*890*	*34*	*0*	*25*	*59*	*831*	*2.8*
Variation S3-C1	*142*	*12*	*0*	*6*	*18*	*124*	*4.2*
Variation S3-C2	*40*	*10*	*0*	*0*	*10*	*29*	*0*
Variation S3-C3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	1,032	47	0	31	78	954	3.0
Timber Canyon	132	16	0	3	20	113	2.5
Flagstaff A – Burnt River Mountain	890	34	0	26	60	830	2.9
Flagstaff B	455	30	0	6	36	420	1.3
Flagstaff B – Burnt River West	313	18	0	<1	18	295	<1
Flagstaff B - Durkee	313	18	0	<1	18	295	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-757. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Confined Animal Feeding Operations							
There are none present in this segment.							
Fallow/Idle Cropland							
Applicant's Proposed Action	<1	<1	0	0	<1	<1	0
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*1*	<1	*0*	*<1*	<1	<1	*20.0*
Variation S3-B3	*1*	<1	*0*	*<1*	<1	<1	*19.4*
Variation S3-B4	*3*	<1	*0*	*<1*	*1*	*2*	*28.0*
Variation S3-B5	*5*	<1	*0*	*<1*	<1	*4*	*9.3*
Variation S3-C1	<1	<1	*0*	*0*	<1	<1	*0*
Variation S3-C2	<1	<1	*0*	*0*	<1	<1	*0*
Variation S3-C3	<1	<1	*0*	*0*	<1	<1	*0*
Variation S3-C4	<1	<1	*0*	*0*	<1	<1	*0*
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	5	*<1*	0	<1	*<1*	4	8.7
Timber Canyon	1	*<1*	0	0	*<1*	*<1*	0
Flagstaff A – Burnt River Mountain	5	*<1*	0	<1	*<1*	4	8.8
Flagstaff B	2	*<1*	0	<1	*<1*	1	14.4
Flagstaff B – Burnt River West	1	*<1*	0	<1	*<1*	*<1*	21.5
Flagstaff B - Durkee	1	*<1*	0	<1	*<1*	*<1*	21.9
Field Crops							
Applicant's Proposed Action	165	9	0	8	17	148	4.9
Variation S3-A1	*117*	*0*	*0*	*4*	*4*	*113*	*3.6*
Variation S3-A2	*2*	*0*	*0*	*<1*	*1*	*1*	*48.2*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*123*	*<1*	*0*	*<1*	*<1*	*122*	*<1*
Variation S3-B3	*123*	*<1*	*0*	*<1*	*<1*	*122*	*<1*
Variation S3-B4	*670*	*14*	*0*	*18*	*32*	*638*	*2.7*
Variation S3-B5	*678*	*14*	*0*	*22*	*35*	*642*	*3.2*
Variation S3-C1	*48*	*9*	*0*	*4*	*13*	*35*	*8.0*

Table 3-757. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 3—Baker Valley in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C2	*68*	*11*	*0*	*3*	*14*	*54*	*3.8*
Variation S3-C3	*761*	*7*	*0*	*6*	*13*	*749*	*<1*
Variation S3-C4	*8*	*1*	*0*	*2*	*3*	*5*	*24.1*
Variation S3-C5	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S3-C6	*6*	*<1*	*0*	*2*	*3*	*4*	*40.5*
Flagstaff A	726	23	0	30	53	673	4.2
Timber Canyon	468	19	0	36	54	414	7.6
Flagstaff A – Burnt River Mountain	1,440	21	0	32	53	1,387	2.2
Flagstaff B	171	9	0	8	18	153	4.9
Flagstaff B – Burnt River West	125	<1	0	2	2	123	1.5
Flagstaff B - Durkee	129	<1	0	7	8	122	5.7
Fruit Tree Nuts							
There are none present in this segment.							
Grass Pasture							
Applicant's Proposed Action	273	6	0	26	31	242	9.4
Variation S3-A1	*1*	*0*	*0*	*<1*	*1*	*0*	*92.1*
Variation S3-A2	*2*	*0*	*0*	*0*	*0*	*2*	*17.9*
Variation S3-B1	*3*	*0*	*0*	*0*	*0*	*3*	*0*
Variation S3-B2	*6*	*0*	*0*	*1*	*1*	*5*	*14.6*
Variation S3-B3	*6*	*0*	*0*	*1*	*1*	*5*	*14.1*
Variation S3-B4	*25*	*2*	*0*	*7*	*9*	*16*	*27.8*
Variation S3-B5	*24*	*1*	*0*	*7*	*8*	*16*	*29.3*
Variation S3-C1	*266*	*6*	*0*	*24*	*30*	*236*	*9.1*
Variation S3-C2	*296*	*13*	*0*	*25*	*38*	*258*	*8.4*
Variation S3-C3	*92*	*11*	*0*	*6*	*17*	*75*	*6.4*
Variation S3-C4	*90*	*11*	*0*	*5*	*16*	*74*	*6.0*
Variation S3-C5	*137*	*0*	*0*	*19*	*19*	*117*	*14.0*
Variation S3-C6	*39*	*0*	*0*	*7*	*7*	*33*	*16.9*
Flagstaff A	295	7	0	33	40	255	11.1
Timber Canyon	108	5	0	13	19	89	12.4
Flagstaff A – Burnt River Mountain	121	12	0	15	28	93	12.8
Flagstaff B	277	6	0	26	32	244	9.5

Table 3-757. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Flagstaff B – Burnt River West	149	0	0	20	20	129	13.3
Flagstaff B - Durkee	50	0	0	10	10	41	19.0
Vegetables							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B2	*<1*	*<1*	*0*	*0*	*<1*	*0*	*0*
Variation S3-B3	*<1*	*<1*	*0*	*0*	*<1*	*0*	*0*
Variation S3-B4	*11*	*0*	*0*	*1*	*1*	*10*	*9.4*
Variation S3-B5	*11*	*0*	*0*	*2*	*2*	*9*	*17.0*
Variation S3-C1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C4	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C5	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-C6	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Flagstaff A	11	0	0	2	2	9	17.6
Timber Canyon	0	0	0	0	0	0	0
Flagstaff A – Burnt River Mountain	11	0	0	2	2	9	17.8
Flagstaff B	<1	<1	0	0	<1	0	0
Flagstaff B – Burnt River West	<1	<1	0	0	<1	0	0
Flagstaff B - Durkee	<1	<1	0	0	<1	0	0
Tree Farms							
There are none present in this segment.							

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as pipelines, transmission lines, and transportation development, are likely to have similarly affected existing agriculture through permanent occupation of agriculture land by nonagricultural uses. There are currently no RFFAs identified in Segment 3. The past and present projects identified below include those used to quantitatively assess incremental loss existing agriculture in the CIAA for Segment 3.

Past and present actions in the CIAA for existing agriculture include:

- Irrigated Agriculture (Center Pivot Irrigation, Dryland, Flood irrigation, and Other mechanized)
  - Pipelines of unknown ownership
  - Transmission lines of unknown ownership
  - Cornet-Windy Ridge Fire
  - Roads, railroads, mining, residences, outstructures, and other non-residential structures
- Crop Production (Fallow, Field Crops, Fruit and Tree Nuts, Grass Pasture, Vegetables, and Tree Farms) and CAFOs
  - Pipelines of unknown ownership
  - Transmission lines of unknown ownership
  - Cornet-Windy Ridge Fire
  - Roads, railroads, mining, residences, outstructures, and other non-residential structures

RFFA in the CIAA for existing agriculture is Aggregate/Mineral Mining. When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes and route variations in Segment 3 would contribute to and increase the cumulative impacts on most irrigation types and crops at varying degrees. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of agriculture in the CIAA.

B2H Project implementation would result in the greatest incremental disturbance to other mechanized irrigation and field crops for all alternative routes. Incremental disturbance to other crop types and irrigated agriculture is anticipated to result from B2H Project implementation to similar, but lesser extents. The percent of project impact would be highest for flood (6.7 percent [25 of 381 total acres available] on the Timber Canyon Alternative) and fallow/idle cropland (21.9 percent on the Flagstaff B – Durkee Alternative; note: only one total acre is available). Impacts could include escalation of the conversion of agricultural land to nonagricultural uses from growth induced effects, changing land uses making agriculture no longer compatible, and creation of new utility corridors.

Important Farmland, High-Value Soils, and CRP Lands

Table 3-758 and Table 3-759 present a summary of cumulative effects for important farmland and high-value soils in Segment 3. Table 3-758 and Table 3-759 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance. There are no quantitative data available for CRP lands for the entire B2H Project area. Potential cumulative effects on these lands will be discussed qualitatively below.

Table 3-758. Cumulative Effects Summary for Important Farmland in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	32,182	1,299	0	822	2,121	30,061	3
Variation S3-A1	*6,984*	*121*	*0*	*136*	*257*	*6,727*	*2*
Variation S3-A2	*7,562*	*139*	*0*	*66*	*205*	*7,357*	*<1*
Variation S3-B1	*9,619*	*316*	*0*	*209*	*524*	*9,095*	*2*
Variation S3-B2	*9,371*	*516*	*0*	*204*	*720*	*8,651*	*2*
Variation S3-B3	*10,041*	*611*	*0*	*209*	*821*	*9,220*	*2*
Variation S3-B4	*9,872*	*643*	*0*	*218*	*862*	*9,010*	*2*
Variation S3-B5	*9,722*	*550*	*0*	*210*	*760*	*8,962*	*2*
Variation S3-C1	*13,012*	*773*	*0*	*346*	*1,120*	*11,893*	*3*
Variation S3-C2	*13,589*	*1,002*	*0*	*348*	*1,351*	*12,238*	*3*
Variation S3-C3	*10,206*	*794*	*0*	*244*	*1,038*	*9,168*	*2*
Variation S3-C4	*10,336*	*788*	*0*	*254*	*1,043*	*9,293*	*2*
Variation S3-C5	*11,137*	*222*	*0*	*313*	*535*	*10,602*	*3*
Variation S3-C6	*15,937*	*202*	*0*	*498*	*700*	*15,237*	*3*
Flagstaff A	31,611	1,509	0	824	2,333	29,278	3
Timber Canyon	30,010	818	0	708	1,526	28,483	2
Flagstaff A – Burnt River Mountain	28,805	1,530	0	731	2,260	26,544	3
Flagstaff B	31,929	1,570	0	823	2,393	29,536	3
Flagstaff B – Burnt River West	30,632	1,037	0	721	1,757	28,875	2
Flagstaff B - Durkee	34,854	999	0	969	1,968	32,886	3

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-759. Cumulative Effects Summary for High-Value Soils in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	3,360	517	0	66	583	2,777	2
Variation S3-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S3-B1	*2,156*	*58*	*0*	*51*	*108*	*2,048*	*2*
Variation S3-B2	*907*	*39*	*0*	*31*	*70*	*837*	*3*
Variation S3-B3	*907*	*39*	*0*	*31*	*69*	*838*	*3*
Variation S3-B4	*2,076*	*98*	*0*	*58*	*156*	*1,920*	*3*
Variation S3-B5	*2,076*	*98*	*0*	*59*	*157*	*1,918*	*3*
Variation S3-C1	*1,204*	*460*	*0*	*16*	*476*	*728*	*1*
Variation S3-C2	*1,632*	*533*	*0*	*15*	*548*	*1,084*	*1*
Variation S3-C3	*1,824*	*544*	*0*	*14*	*558*	*1,266*	*<1*
Variation S3-C4	*1,763*	*543*	*0*	*10*	*553*	*1,210*	*<1*
Variation S3-C5	*374*	*70*	*0*	*6*	*76*	*299*	*1*
Variation S3-C6	*431*	*73*	*0*	*10*	*83*	*348*	*2*
Flagstaff A	3,280	558	0	76	634	2,646	2
Timber Canyon	1,586	469	0	27	497	1,090	2
Flagstaff A – Burnt River Mountain	3,900	642	0	74	717	3,183	2
Flagstaff B	2,111	499	0	46	545	1,567	2
Flagstaff B – Burnt River West	1,282	109	0	39	147	1,135	3
Flagstaff B - Durkee	1,339	111	0	43	154	1,184	3

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as pipelines, wind development, transmission lines, and transportation development, are likely to have similarly affected important farmland and high-value soils through permanent occupation of agriculture land by nonagricultural uses. There are no existing RFFAs in Segment 3. The past and present projects identified below include those used to quantitatively assess incremental loss of important farmland and high-value soils in the CIAA for Segment 3. Past and present actions in the CIAA for important and high-value soils include:

- Oregon Dams
- Pipelines and transmission lines of unknown ownership
- FCC Communication Towers and other communication facilities

- Roads, rest stops, mining, railroads, residences, outstructures, School/Educational Facilities and other non-residential structures, and campgrounds
- Lime Hill Fire
- Cornet-Windy Ridge Fire

There are no RFFAs in the CIAA for important and high-value soils.

B2H Project implementation would result in the greatest incremental project development to important farmland and high-value soils on the Flagstaff B – Durkee Alternative. Of the alternatives considered in Segment 3, Flagstaff B – Burnt River West Alternative would have the least percent of project impact on important farmland and high-value soils. All alternatives in Segment 3 would have less than 3 percent of project impact on important farmland and high-value soils. Types of impacts would be similar to those discussed under existing agriculture.

Short- and long-term cumulative effects on CRP lands also would be similar to those described for important farmland and high-value soils, but may be further compounded by a reduction in payment a landowner may receive for the CRP lands crossed by multiple types of past and present actions and RFFAs (including the B2H Project).

Livestock Grazing

Table 3-760 presents a summary of cumulative effects for livestock grazing in Segment 3. Table 3-760 summarizes the extent of livestock grazing in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-760. Cumulative Effects Summary for Livestock Grazing in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	108,963	1,136	0	765	2.001	106,963	<1
Variation S3-A1	*13,913*	*206*	*0*	*86*	*292*	*13,621*	*<1*
Variation S3-A2	*13,913*	*206*	*0*	*79*	*286*	*13,627*	*<1*
Variation S3-B1	*28,366*	*392*	*0*	*272*	*664*	*27,702*	*1*
Variation S3-B2	*11,799*	*256*	*0*	*192*	*448*	*11,351*	*2*
Variation S3-B3	*11,799*	*256*	*0*	*190*	*446*	*11,353*	*2*
Variation S3-B4	*10,045*	*199*	*0*	*156*	*355*	*9,690*	*2*
Variation S3-B5	*10,045*	*199*	*0*	*158*	*357*	*9,688*	*2*
Variation S3-C1	*64,015*	*512*	*0*	*311*	*823*	*63,191*	*<1*
Variation S3-C2	*60,206*	*526*	*0*	*303*	*829*	*59,377*	*<1*

Table 3-760. Cumulative Effects Summary for Livestock Grazing in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Variation S3-C3	*43,548*	*450*	*0*	*231*	*681*	*42,777*	*<1*
Variation S3-C4	*48,381*	*467*	*0*	*243*	*709*	*47,672*	*<1*
Variation S3-C5	*55,111*	*318*	*0*	*494*	*811*	*54,300*	*1*
Variation S3-C6	*65,844*	*342*	*0*	*547*	*888*	*64,956*	*1*
Flagstaff A	98,673	1,139	0	652	1,791	98,882	<1
Timber Canyon	159,734	1,666	0	1,178	2,843	156,891	<1
Flagstaff A – Burnt River Mountain	78,116	1,077	0	578	1,655	76,461	<1
Flagstaff B	100,428	1,197	0	685	1,882	98,546	<1
Flagstaff B – Burnt River West	91,524	1,002	0	835	1,837	89,687	1
Flagstaff B - Durkee	102,257	1,026	0	897	1,923	100,334	1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as wind development, pipelines, transmission lines, and transportation development, are likely to have similarly affected livestock grazing. Construction of several RFFAs in the CIAA would result in similar cumulative effects on livestock grazing, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss to livestock grazing in the CIAA for Segment 3.

Past and present actions within the geographic scope for livestock grazing include:

- Pipelines of unknown ownership
- Transmission lines of unknown ownership
- Oregon Dams
- Elkhorn Wind Turbines
- FCC Communication Towers and other communication facilities
- Cornet-Windy Ridge Fire
- Roads, residential, outstructures, railroads, school and educational facilities, mining, and non-residential structures

RFFAs included identified in the CIAA include mining.

The percentage of the B2H Project impacts located in grazing allotments for all alternative routes in Segment 3 would be one percent, though some variations are 2 percent. The Timber Canyon

Alternative would result in the greatest incremental project development. The short-term cumulative effects of the B2H Project, in addition to the past and present actions and RFFAs, on livestock grazing would include construction activities that may require the addition of gates to existing fences; construction-related disturbances (e.g., noise from vehicles, equipment, and personnel) associated with development of access roads, site grading, building structures, and larger footprints of disturbance before restoration efforts occur. The long-term cumulative effects would be reduced grazing land available where permanent disturbance would occur from the B2H Project and other actions. The use of the land for grazing purposes is anticipated to continue after construction of the B2H Project is completed.

Segment 4—Brogan

Existing Agriculture

Table 3-761 and Table 3-762 present a summary of cumulative effects for existing agriculture: irrigated agriculture (center pivot, flood, and other mechanized) and crop production (fallow/idle, field crops, grass pasture, and vegetables) in Segment 4. Table 3-761 and Table 3-762 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-761. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Center Pivot							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	358	12	0	6	18	340	1.6
Willow Creek	677	11	0	15	27	650	2.3
Dryland							
There are none present in this segment.							
Flood							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Table 3-761. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Tub Mountain South	484	28	0	32	60	424	6.7
Willow Creek	36	2	0	4	6	31	10.5
Other Mechanized							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	51	13	0	5	18	33	10.5
Willow Creek	65	<1	0	4	5	61	6.6

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-762. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Confined Animal Feeding Operations							
There are none present in this segment							
Fallow/Idle Cropland							
Applicant's Proposed Action	1	<1	0	1	1	0	94.3
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	122	6	0	5	11	110	4.2
Willow Creek	12	0	0	3	3	9	22.7

Table 3-762. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Field Crops							
Applicant's Proposed Action	<1	<1	0	<1	<1	<1	53.4
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	1,989	93	0	46	139	1,849	2.3
Willow Creek	1,112	20	0	43	63	1,049	3.9
Fruit Tree Nuts							
There are none present in this segment.							
Grass Pasture							
Applicant's Proposed Action	4,384	42	0	117	160	4,224	2.7
Variation S4-A1	*618*	*8*	*0*	*33*	*41*	*577*	*5.4*
Variation S4-A2	*600*	*8*	*0*	*21*	*29*	*571*	*3.5*
Variation S4-A3	*600*	*8*	*0*	*21*	*29*	*571*	*3.5*
Tub Mountain South	91,225	763	0	475	1,238	89,987	<1
Willow Creek	14,149	124	0	229	353	13,796	1.6
Vegetables							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Tub Mountain South	4	0	0	<1	<1	4	15.0
Willow Creek	<1	<1	0	0	<1	<1	0
Tree Farms							
There are none present in this segment.							

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as transmission lines and transportation development, are likely to have similarly affected existing agriculture through permanent occupation of agriculture land by nonagricultural uses. Construction of several RFFAs in the CIAA would result in similar cumulative effects on existing agriculture, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs

identified below include those used to quantitatively assess incremental loss existing agriculture in the CIAA for Segment 4.

Past and present actions in the CIAA for existing agriculture include:

- Irrigated Agriculture (Center Pivot Irrigation, Dryland, Flood irrigation, and Other mechanized):
  - Transmission lines of unknown ownership
  - Roads, railroads, residences, and outstructures
- Crop Production (Fallow, Field Crops, Fruit and Tree Nuts, Grass Pasture, Vegetables, and Tree Farms) and CAFOs:
  - Pipelines of unknown ownership
  - Transmission lines of unknown ownership
  - Oregon Dams
  - Lime Hill Fire
  - Communication Towers – FCC
  - Roads, mining, residences, outstructures, and other non-residential structures

RFFAs in the CIAA for existing agriculture include:

- Oil and/or Gas Development
- Aggregate/Mineral Mining

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes and route variations in Segment 4 would contribute to and increase the cumulative impacts on most irrigation types and crops at varying degrees. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of agriculture in the CIAA.

B2H Project implementation would result in the greatest incremental disturbance to flood irrigation and grasslands/pasture for all alternative routes. Incremental disturbance to other crop types and irrigated agriculture is anticipated to result from B2H Project implementation to similar, but lesser extents. The percent of project impact would be highest for flood and other mechanized (10.5 percent [5 of 15 total acres] on the Tub Mountain South Alternative) and fallow/idle cropland (94.3 percent [most of the one acre available] on the Applicant's Proposed Action Alternative). Impacts could include escalation of the conversion of agricultural land to nonagricultural uses from growth induced effects, changing land uses making agriculture no longer compatible, and creation of new utility corridors.

Important Farmland, High-Value Soils, and CRP Lands

Table 3-763 and Table 3-764 present a summary of cumulative effects for important farmland and high-value soils in Segment 4. Table 3-763 and Table 3-764 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-763. Cumulative Effects Summary for Important Farmland in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	8,058	68	0	166	234	7,824	2
Variation S4-A1	*4,591*	*59*	*0*	*129*	*188*	*4,403*	*3*
Variation S4-A2	*4,527*	*62*	*0*	*126*	*188*	*4,338*	*3*
Variation S4-A3	*4,653*	*69*	*0*	*130*	*199*	*4,455*	*3*
Tub Mountain South	12,672	595	0	250	845	11,826	2
Willow Creek	8,496	245	0	176	421	8,075	2

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-764. Cumulative Effects Summary for High-Value Soils in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S4-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S4-A3	*126*	*7*	*0*	*1*	*7*	*119*	<1
Tub Mountain South	21,825	624	0	62	685	21,139	<1
Willow Creek	21,514	580	0	22	602	20,912	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as dams, pipelines, transmission lines, and transportation development, are likely to have similarly affected important farmland and high-value soils through permanent occupation of agriculture land by nonagricultural uses. There are no RFFAs identified in Segment 4. The past and present projects identified below include those used to quantitatively assess incremental loss of important farmland and high-value soils in the CIAA for Segment 4. Past and present actions in the CIAA for important and high-value soils include:

- Oregon Dams
- Lime Hill Fire

- Pipelines and transmission lines of unknown ownership
- Roads, railroads, residences, outstructures, and other non-residential structures

An RFFA in the CIAA for important and high-value soils is oil and gas development.

B2H Project implementation would result in the greatest incremental project development to important farmland and high-value soils on the Applicant's Proposed Action Alternative. All alternatives in Segment 4 would have less than one percent of project impact on important farmland and high-value soils, though route variations would have as much as 3 percent. Types of impacts would be similar to those discussed under existing agriculture.

Livestock Grazing

Table 3-765 presents a summary of cumulative effects for livestock grazing in Segment 4. Table 3-765 summarizes the extent of livestock grazing in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-765. Cumulative Effects Summary for Livestock Grazing in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	158,201	1,244	0	886	2,130	156,070	<1
Variation S4-A1	*34,429*	*182*	*0*	*134*	*316*	*34,113*	*<1*
Variation S4-A2	*34,429*	*182*	*0*	*128*	*310*	*34,119*	*<1*
Variation S4-A3	*34,429*	*182*	*0*	*130*	*312*	*34,117*	*<1*
Tub Mountain South	150,045	898	0	700	1,598	148,447	<1
Willow Creek	113,587	704	0	529	1,233	112,353	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as wind development, pipelines, transmission lines, and transportation development, are likely to have similarly affected livestock grazing. Construction of several RFFAs in the CIAA would result in similar cumulative effects on livestock grazing, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss to livestock grazing in the CIAA for Segment 4.

Past and present actions in the CIAA for livestock grazing include:

- Pipelines of unknown ownership
- Transmission lines of unknown ownership

- Oregon Dams
- Huntington Wind Turbines
- FCC Communication Towers and other communication facilities
- Roads, residential, outstructures, communication facilities, flood control facilities, mining, and non-residential structures

RFFAs identified in the CIAA for livestock grazing include:

- Oil and/or Gas Development
- Mining
- Tub Mountain Gravel Pit

The percentage of the B2H Project impacts located in grazing allotments for all alternative routes in Segment 4 would be less than 1 percent. The Applicant's Proposed Action Alternative would result in the greatest incremental project development. The short-term cumulative effects of the B2H Project, in addition to the past and present actions and RFFAs, on livestock grazing would include construction activities that may require the addition of gates to existing fences; construction-related disturbances (e.g., noise from vehicles, equipment, and personnel) associated with development of access roads, site grading, building structures, and larger footprints of disturbance before restoration efforts occur. The long-term cumulative effects would be reduced grazing land available where permanent disturbance would occur from the B2H Project and other actions. The use of the land for grazing purposes is anticipated to continue after construction of the B2H Project is completed.

Segment 5—Malheur

Existing Agriculture

Table 3-766 and Table 3-767 present a summary of cumulative effects for existing agriculture: irrigated agriculture (flood) and crop production (fallow/idle, field crops, grass pasture) in Segment 5.
Table 3-766 and Table 3-767 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-766. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Center Pivot							
There are none present in this segment.							
Dryland							
There are none present in this segment.							
Flood							
Applicant's Proposed Action	0	0	0	0	0	0	0
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B2	*113*	*3*	*0*	*7*	*10*	*104*	*5.9*
Malheur S	0	0	0	0	0	0	0
Malheur A	0	0	0	0	0	0	0
Other Mechanized							
There are none present in this segment.							

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-767. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Confined Animal Feeding Operations							
There are none present in this segment.							
Fallow/Idle Cropland							
Applicant's Proposed Action	17	<1	0	<1	0	17	1.3
Variation S5-A1	*15*	*0*	*0*	*0*	*0*	*15*	*0*
Variation S5-A2	*0*	*0*	*0*	*3*	*0*	*0*	*0*
Variation S5-B1	*1*	*<1*	*0*	*0*	*<1*	*1*	*0*
Variation S5-B2	*7*	*<1*	*0*	*3*	*3*	*4*	*39.8*

Table 3-767. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Malheur S	6	0	0	2	2	4	*35.4*
Malheur A	<1	0	0	0	0	<1	0
Field Crops							
Applicant's Proposed Action	8	<1	0	2	2	6	0
Variation S5-A1	*4*	*0*	*0*	*<1*	*<1*	*4*	*0*
Variation S5-A2	*<1*	*0*	*0*	*<1*	*<1*	*0*	*0*
Variation S5-B1	*<1*	*<1*	*0*	*0*	*<1*	*<1*	*0*
Variation S5-B2	*167*	*5*	*0*	*7*	*11*	*156*	*0*
Malheur S	9	<1	0	1	2	7	0
Malheur A	9	<1	0	1	2	7	0
Fruit Tree Nuts							
There are none present in this segment.							
Grass Pasture							
Applicant's Proposed Action	81,092	604	0	444	1,048	80,044	<1
Variation S5-A1	*55,101*	*304*	*0*	*106*	*410*	*54,691*	*<1*
Variation S5-A2	*55,221*	*304*	*0*	*115*	*419*	*54,801*	*<1*
Variation S5-B1	*6,465*	*86*	*0*	*4*	*90*	*6,375*	*<1*
Variation S5-B2	*6,447*	*86*	*0*	*16*	*102*	*6,345*	*<1*
Malheur S	75,772	555	0	361	916	74,857	<1
Malheur A	74,810	558	0	319	876	73,934	<1
Vegetables							
There are none present in this segment.							
Tree Farms							
There are none present in this segment.							

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as dams, pipelines, transmission lines, and transportation development, are likely to have similarly affected existing agriculture through permanent occupation of agriculture land by nonagricultural uses. There are no RFFAs identified in Segment 5. The past and present projects identified below include those used to quantitatively assess incremental loss existing agriculture in the CIAA for Segment 5.

Past and present actions in the CIAA for existing agriculture include:

- Irrigated Agriculture (Center Pivot Irrigation, Dryland, Flood irrigation, and Other mechanized):
  - Roads

Past and present actions within the CIAA for crop production and CAFOs include:

- Transmission lines of unknown ownership
- Oregon Dams
- Soda Fire
- Communication Towers – FCC
- Roads, railroads, mining, campground, outstructures, and other non-residential structures

RFFAs in the CIAA for existing agriculture include:

- Oil and/or Gas Development
- Aggregate/Mineral Mining
- Vegetation Management

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes and route variations in Segment 5 would contribute to and increase the cumulative impacts on most irrigation types and crops at varying degrees. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of agriculture in the CIAA.

B2H Project implementation would result in the greatest incremental disturbance to grasslands/pasture for all alternative routes. Incremental disturbance to other crop types and irrigated agriculture is anticipated to result from B2H Project implementation to lesser extents. The percent of project impact would be highest for fallow/idle cropland (35.4 percent [2 of 6 total acres available] on the Malheur S Alternative). Impacts could include escalation of the conversion of agricultural land to nonagricultural uses from growth induced effects, changing land uses making agriculture no longer compatible, and creation of new utility corridors.

Important Farmland, High-Value Soils, and CRP Lands

Table 3-768 and Table 3-769 present a summary of cumulative effects for important farmland and high-value soils in Segment 5. Table 3-768 and Table 3-769 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-768. Cumulative Effects Summary for Important Farmland in Segment 5—Malheur in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	51	4	0	0	4	47	0
Variation S5-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S5-B2	*395*	*22*	*0*	*23*	*45*	*350*	*6*
Malheur S	0	0	0	0	0	0	0
Malheur A	0	0	0	0	0	0	0
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Table 3-769. Cumulative Effects Summary for High-Value Soils in Segment 5—Malheur in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	37,805	952	0	142	1,094	36,711	<1
Variation S5-A1	*20,469*	*472*	*0*	*27*	*498*	*19,970*	*<1*
Variation S5-A2	*20,469*	*472*	*0*	*36*	*508*	*19,961*	*<1*
Variation S5-B1	*2,679*	*87*	*0*	*20*	*107*	*2,572*	*<1*
Variation S5-B2	*2,871*	*97*	*0*	*16*	*113*	*2,758*	*<1*
Malheur S	35,126	865	0	72	937	34,189	<1
Malheur A	35,126	865	0	62	926	34,199	<1
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Several past and present actions in the CIAA, such as dams, transmission lines, and transportation development, are likely to have similarly affected important farmland and high-value soils through permanent occupation of agriculture land by nonagricultural uses. Construction of several RFFAs in the CIAA would result in similar cumulative effects on important farmland and high-value soils, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss of important farmland and high-value soils in the CIAA for Segment 5. Past and present actions in the CIAA for important and high-value soils include:

- Transmission lines of unknown ownership
- Roads, mining, railroads, residences, outstructures, and other non-residential structures
- Fires and vegetation treatments

RFFAs in the CIAA for important and high-value soils include herbicide treatments and oil and gas development.

B2H Project implementation would result in the greatest incremental project development to important farmland and high-value soils on the Malheur S Alternative. All alternatives in Segment 5 would have less than one percent of project impact on important farmland and high-value soils. Types of impacts would be similar to those discussed under existing agriculture.

Livestock Grazing

Table 3-770 presents a summary of cumulative effects for livestock grazing in Segment 5. Table 3-770 summarizes the extent of livestock grazing in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-770. Cumulative Effects Summary for Livestock Grazing in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	325,806	2,396	0	833	3,230	322,577	<1
Variation S5-A1	*115,535*	*509*	*0*	*134*	*644*	*114,891*	*<1*
Variation S5-A2	*115,535*	*509*	*0*	*146*	*655*	*114,879*	*<1*
Variation S5-B1	*96,887*	*1,032*	*0*	*45*	*1,077*	*95,811*	*<1*
Variation S5-B2	*96,887*	*1,032*	*0*	*15*	*1,047*	*95,840*	*<1*
Malheur S	300,681	2,354	0	950	3,305	297,376	<1
Malheur A	300,681	2,354	0	906	3,261	297,420	<1

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as dams, transmission lines, and transportation development, are likely to have similarly affected livestock grazing. Construction of several RFFAs in the CIAA would result in similar cumulative effects on livestock grazing, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss to livestock grazing in the CIAA for Segment 5.

Past and present actions in the CIAA for livestock grazing include:

- Transmission lines of unknown ownership
- Soda Fire
- Oregon Dams
- FCC Communication Towers
- Roads, railroads, residences, mining, campground, flood control facility, outstructures, and other non-residential structures

RFFAs identified in the CIAA for livestock grazing include mining and oil and/or gas development.

The percentage of the B2H Project impacts located in grazing allotments for all alternative routes in Segment 5 would be less than 1 percent. The Malheur S Alternative would result in the greatest incremental project development. The short-term cumulative effects of the B2H Project, in addition to the past and present actions and RFFAs, on livestock grazing would include construction activities that may require the addition of gates to existing fences; construction-related disturbances (e.g., noise from vehicles, equipment, and personnel) associated with development of access roads, site grading, building structures, and larger footprints of disturbance before restoration efforts occur. The long-term cumulative effects would be reduced grazing land available where permanent disturbance would occur from the B2H Project and other actions. The use of the land for grazing purposes is anticipated to continue after construction of the B2H Project is completed.

Segment 6—Treasure Valley

Existing Agriculture

Table 3-771 and Table 3-772 present a summary of cumulative effects for existing agriculture: irrigated agriculture (flood) and crop production (fallow/idle, field crops, and grass pasture) in Segment 6. Table 3-771 and Table 3-772 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-771. Cumulative Effects Summary for Existing Agriculture: Irrigated Agriculture in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Center Pivot							
There are none present in this segment.							
Dryland							
There are none present in this segment.							
Flood							
Applicant's Proposed Action	85	7	0	4	12	73	4.9
Variation S6-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S6-A2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S6-B1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S6-B2	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other Mechanized							
There are none present in this segment.							

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-772. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Confined Animal Feeding Operations							
There are none present in this segment.							
Fallow/Idle Cropland							
Applicant's Proposed Action	2	0	0	<1	<1	2	11.4
Variation S6-A1	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S6-A2	*<1*	*0*	*0*	*0*	*0*	*<1*	*0*
Variation S6-B1	*1*	*0*	*0*	*<1*	*<1*	*1*	*16.4*
Variation S6-B2	*1*	*0*	*0*	*<1*	*<1*	*<1*	*21.1*

Table 3-772. Cumulative Effects Summary for Existing Agriculture: Crop Production and Confined Animal Feeding Operations in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development (acres)	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Field Crops							
Applicant's Proposed Action	13	0	0	5	5	9	11.4
Variation S6-A1	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Variation S6-A2	*1*	*0*	*0*	*0*	*0*	*1*	*0*
Variation S6-B1	*1*	*0*	*0*	*1*	*1*	*1*	*16.4*
Variation S6-B2	*0*	*0*	*0*	*0*	*0*	*0*	*21.1*
Fruit Tree Nuts							
There are none present in this segment.							
Grass Pasture							
Applicant's Proposed Action	12,270	939	0	180	1,119	11,151	1.5
Variation S6-A1	*5,674*	*339*	*0*	*50*	*389*	*5,285*	*<1*
Variation S6-A2	*7,841*	*517*	*0*	*69*	*586*	*7,255*	*<1*
Variation S6-B1	*2,702*	*186*	*0*	*81*	*267*	*2,435*	*3.0*
Variation S6-B2	*2,550*	*175*	*0*	*63*	*238*	*2,311*	*2.5*
Vegetables							
There are none present in this segment.							
Tree Farms							
There are none present in this segment.							

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as transmission lines and transportation development, are likely to have similarly affected existing agriculture through permanent occupation of agriculture land by nonagricultural uses. There are no RFFAs identified in Segment 6. The past and present projects identified below include those used to quantitatively assess incremental loss existing agriculture in the CIAA for Segment 6.

Past and present actions in the CIAA for existing agriculture include:

- Irrigated Agriculture (Center Pivot Irrigation, Dryland, Flood irrigation, and Other mechanized):
  - Transmission lines of unknown ownership
  - Residential and outstructures
  - Soda Fire

- Crop Production (Fallow, Field Crops, Fruit and Tree Nuts, Grass Pasture, Vegetables, and Tree Farms) and CAFOs:
  - Transmission lines of unknown ownership
  - Gateway West Feasible Alternative
  - Gateway West Proposed Route
  - Soda Fire
  - Roads, residential, railroads, mining, cemetery, campground, outstructures, and other non-residential structures

RFFAs identified in the CIAA for existing agriculture include:

- Active mining claims
- Vegetation Management
- Oil and/or Gas Development

When considered with other actions, the Applicant's Proposed Action Alternative and all alternative routes and route variations in Segment 6 would contribute to and increase the cumulative impacts on most irrigation types and crops at varying degrees. In general, the extent of B2H Project-related disturbance would account for a small portion of the total extent of agriculture in the CIAA.

B2H Project implementation would result in the greatest incremental disturbance to grasslands/pasture for all alternative routes. Incremental disturbance to other crop types and irrigated agriculture is anticipated to result from B2H Project implementation to lesser extents. The percent of project impact would be highest for field crops and fallow/idle cropland (11.4 percent on the Applicant's Proposed Action Alternative). Impacts could include escalation of the conversion of agricultural land to nonagricultural uses from growth induced effects, changing land uses making agriculture no longer compatible, and creation of new utility corridors.

Important Farmland, High-Value Soils, and CRP Lands

Table 3-773 and Table 3-774 present a summary of cumulative effects for important farmland and high-value soils in Segment 6. Table 3-773 and Table 3-774 summarize the extent of existing agriculture in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-773. Cumulative Effects Summary for Important Farmland in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	6,598	399	0	156	554	6,043	2
Variation S6-A1	*400*	*1*	*0*	*13*	*14*	*386*	*3*
Variation S6-A2	*823*	*84*	*0*	*23*	*106*	*717*	*3*
Variation S6-B1	*5,932*	*377*	*0*	*90*	*467*	*5,464*	*2*
Variation S6-B2	*5,795*	*372*	*0*	*76*	*448*	*5,347*	*1*

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Table 3-774. Cumulative Effects Summary for High-Value Soils in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	3,220	109	0	99	208	3,012	<1
Variation S6-A1	*205*	*1*	*0*	*11*	*12*	*193*	*<1*
Variation S6-A2	*14,900*	*396*	*0*	*27*	*424*	*14,476*	*<1*
Variation S6-B1	*2,554*	*87*	*0*	*36*	*123*	*2,431*	*<1*
Variation S6-B2	*2,417*	*82*	*0*	*25*	*107*	*2,310*	*<1*

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as transmission lines and transportation development, are likely to have similarly affected important farmland and high-value soils through permanent occupation of agriculture land by nonagricultural uses. Construction of several RFFAs in the CIAA would result in similar cumulative effects on important farmland and high-value soils, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss of important farmland and high-value soils in the CIAA for Segment 6. Past and present actions in the CIAA for important and high-value soils include:

- Transmission lines of unknown ownership
- FCC Communication towers

- Roads, mining, residences, outstructures, and other non-residential structures
- Soda Fire
- Vegetation treatments

RFFAs identified in the CIAA for important and high-value soils include:

- Herbicide treatments
- Aggregate/Mineral Mining

B2H Project implementation would result in the greatest incremental project development to important farmland and high-value soils on variations Variation S6-B2 and Variation S6-A2. The only alternative in Segment 6 would have less than one percent of project impact on important farmland and high-value soils, though variations would have as much as 2 percent. Types of impacts would be similar to those discussed under existing agriculture.

Livestock Grazing

Table 3-775 presents a summary of cumulative effects for livestock grazing in Segment 6. Table 3-775 summarizes the extent of livestock grazing in the CIAA, the extent of existing and anticipated cumulative disturbance, the incremental disturbance resulting from implementation of the B2H Project, and the amount of B2H Project disturbance relative to the total anticipated cumulative disturbance.

Table 3-775. Cumulative Effects Summary for Livestock Grazing in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact on Total Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	171,295	2,704	0	517	3,222	168,074	<1
Variation S6-A1	*84,949*	*1,164*	*0*	*174*	*1,338*	*83,612*	*<1*
Variation S6-A2	*84,949*	*1,164*	*0*	*128*	*1,291*	*83,658*	*<1*
Variation S6-B1	*91,626*	*1,571*	*0*	*285*	*1,857*	*89,770*	*<1*
Variation S6-B2	*92,966*	*1,423*	*0*	*288*	*1,711*	*91,255*	*<1*

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Several past and present actions in the CIAA, such as transmission lines and transportation development, are likely to have similarly affected livestock grazing. Construction of several RFFAs in the CIAA would result in similar cumulative effects on livestock grazing, though it is assumed these actions would take steps to avoid, minimize, and mitigate potential impacts. The past and present actions and other RFFAs identified below include those used to quantitatively assess incremental loss to livestock grazing in the CIAA for Segment 6.

Past and present actions in the CIAA for livestock grazing include:

- Transmission lines of unknown ownership
- Soda Fire
- FCC Communication Towers
- Roads, railroads, mining, outstructures, and other non-residential structures

RFFAs identified in the CIAA for livestock grazing include mining.

The percentage of the B2H Project impacts located in grazing allotments for all alternative routes in Segment 6 would be less than 1 percent. Variations S6-A1 and S6-B2 would result in the greatest incremental project development. The short-term cumulative effects of the B2H Project, in addition to the past and present actions and RFFAs, on livestock grazing would include construction activities that may require the addition of gates to existing fences; construction-related disturbances (e.g., noise from vehicles, equipment, and personnel) associated with development of access roads, site grading, building structures, and larger footprints of disturbance before restoration efforts occur. The long-term cumulative effects would be reduced grazing land available where permanent disturbance would occur from the B2H Project and other actions. The use of the land for grazing purposes is anticipated to continue after construction of the B2H Project is completed.

3.3.3.8 Recreation

This section estimates cumulative effects on recreation from the B2H Project in addition to past and present actions and other RFFAs. The approach for analysis of cumulative effects on recreation, including the geographic and temporal scopes of analysis, is presented in Table 3-638. The cumulative effects analysis for recreation considers direct and indirect impacts from the B2H Project (described in Section 3.2.8 (Recreation Resources)) in conjunction with the past and present actions and RFFAs listed in Table 3-639 and Table 3-640. Resources addressed in this section are the same as those addressed in Section 3.2.8.

Issues Identified for Analysis

Potential conflicts with recreational resources include providing recreational users opportunities to use the designated use area and use the right-of-way for the B2H Project and structure placement in a designated SRMA with management restrictions on utility development.

Existing Condition

In general, almost all recreation resources have been affected by development from past and present actions. However, the natural environment has been altered in a manner that allows for past and present recreation actions as well as recreational uses, such as recreational infrastructure, trails, scenic byways, etc. to occur.

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

Effects

The following text summarizes the cumulative effects on recreational uses crossed by Segment 1, including past and present actions and/or RFFAs in addition to the B2H Project.

Blue Mountain Forest State Scenic Corridor

The B2H Project would contribute incrementally to cumulative effects on recreational uses at the Blue Mountain Forest State Park Scenic Corridor day use area as the B2H Project would be located in an area of existing cumulative development for past actions and would contribute less than one percent to development in the scenic corridor. Also, the B2H Project would be designed to span the site, and permanent infrastructure would not affect the scenic corridor. The past and present actions that occur in the Blue Mountain Forest State Scenic Corridor day use area include:

- residential and non-residential structures
- campground
- communication tower
- pipeline
- railroad
- roads
- transmission lines

There are no proposed RFFAs in the CIAA. The short-term cumulative effects of the B2H Project crossing the Blue Mountain Forest State Park Scenic Corridor day use, in addition to the past and present actions, would include limited and/or altered access and increased noise during construction of the transmission project, with long-term improved access as a result of new permanent access roads. The long-term cumulative effect would result from the transmission line spanning the scenic corridor site and potentially affecting the recreational user's experience.

Recreational Trails

The B2H Project would contribute incrementally to cumulative effects on recreational trails as the B2H Project would be designed to span the trails; consequently, permanent infrastructure would not be located directly on the trails. Past and present actions in the area traversed by the recreational trails include:

- Cascade Natural Gas pipeline
- Northwest Corp. Pipeline
- Northwest Corp. Transmission Line
- Oregon Wind Farm
- Perennial Wind Chaser Gas Pipeline
- Umatilla Electric Cooperative (UEC) transmission line
- Active mining (stone, sand, and gravel)

- Campground
- Communication tower
- Railroad
- Residential and non-residential structures
- Rest stop
- Roads
- Pipeline and transmission lines
- Vegetation treatments (e.g. seeding, thinning)

An RFFA in the area near recreational trails would be Buttercreek Wind Farm and oil and gas development. The short-term cumulative effects of the B2H Project crossing recreational trails in addition to the past and present actions and RFFAs would be limited access to the trails during construction, with long-term improved access as a result of new permanent access roads.

Segment 2—Blue Mountains

Hunting Access Areas

The B2H Project would contribute incrementally to cumulative effects on recreational uses at the hunting access areas as the B2H Project would be located in an area of existing cumulative development for past actions and would contribute less than one percent to development in the access areas. Also, the B2H Project would be designed to span access points. The past and present actions that occur in the hunting access areas include:

- residential and non-residential structures
- pipeline
- railroad
- roads
- transmission lines

There are active mining claims for RFFAs in the CIAA. The short-term cumulative effects of the B2H Project crossing the hunting access areas, in addition to the past and present actions and potential development of active mining claims, would include limited and/or altered access and increased noise during construction of the transmission project, with long-term improved access as a result of new permanent access roads. An additional long-term cumulative effect would result from the transmission line spanning the hunting access area and potentially affecting the recreational user's experience.

Grand Tour Scenic Bikeway

The B2H Project would contribute incrementally to cumulative effects on the Grand Tour Scenic Bikeway as the B2H Project would be designed to span the scenic bikeway; consequently, no permanent infrastructure would be located directly on the scenic bikeway. Past and present actions in the CIAA for the Grand Tour Scenic Bikeway include:

- active mines (i.e., stone)
- communication facilities
- dams
- residential and non-residential structures
- pipeline
- railroad
- roads
- transmission lines

There are no RFFAs in the area near scenic bikeway. The short-term cumulative effects of the B2H Project crossing the scenic bikeway, in addition to the past and present actions, would include potentially limiting access to the scenic bikeway and increased noise during construction, with long-term improved access as a result of new permanent access roads. An additional long-term cumulative effect would result from increased industrialization spanning the scenic bikeway. Cumulative effects for the scenic bikeway also are discussed in Section 3.3.3.12.

Recreational Trails

The B2H Project would contribute incrementally to cumulative effects on recreational trails as the B2H Project would be designed to span the trails; permanent infrastructure would not be located directly on the trails, but access roads would be permanent, increasing access to trails. Past and present actions in the area traversed by the recreational trails include:

- Communication tower
- Railroad
- Non-residential structure
- Roads
- Pipeline
- Vegetation treatments (e.g., seeding, thinning)

There are no RFFAs in the area near recreational trails. The short-term cumulative effects of the B2H Project crossing recreational trails in addition to the past and present actions and RFFAs would include limited access to the trails during construction, with increased access for the long term.

Segment 3—Baker Valley

Hunting Access Areas

The B2H Project would contribute incrementally to cumulative effects on recreational uses of hunting access areas as the B2H Project would be located in an area of existing cumulative development for past actions and would contribute less than 4 percent to development in the access areas. Also, the B2H Project would be designed to span access points. The past and present actions that occur in the hunting access areas include:

- Active metal mines and other mining extraction
- Communication facilities
- Residential and non-residential structures
- Pipeline
- Railroad
- Roads
- Transmission lines

There are active mining claims for RFFAs in the CIAA. The short-term cumulative effects of the B2H Project crossing the hunting access areas, in addition to the past and present actions and potential development of active mining claims, would include limited and/or altered access and increased noise during construction of the transmission project. Long-term cumulative effect would result from the transmission line spanning the hunting access area and potentially affecting the recreational user's experience and increasing access.

Grand Tour Scenic Bikeway

The B2H Project would not contribute incrementally to cumulative effects on the Grand Tour Scenic Bikeway as the B2H Project would be designed to span the scenic bikeway; consequently, no permanent infrastructure would be located directly on the scenic bikeway. Past and present actions in the CIAA for the Grand Tour Scenic Bikeway include:

- Active mines (i.e., stone)
- Communication facilities
- Dams
- Residential and non-residential structures
- Pipeline
- Railroad
- Roads
- Transmission lines

There are no RFFAs in the area near scenic bikeway. The short-term cumulative effects of the B2H Project crossing the scenic bikeway, in addition to the past and present actions, would be potentially limiting access to the scenic bikeway and increased noise during construction. Long-term cumulative effects would include increased industrialization spanning the scenic bikeway and increased access. Cumulative effects for the scenic bikeway also are discussed in Section 3.3.3.12.

Hells Canyon All-American Highway

The B2H Project would not contribute incrementally to cumulative effects on the Hells Canyon All-American Highway as the B2H Project would be designed to span the highway; consequently, no permanent infrastructure would be located directly on the highway. Past and present actions in the CIAA for the Hells Canyon All-American Highway include:

- Active mines (i.e., stone)
- Communication facilities
- Residential and non-residential structures
- Pipeline
- Railroad
- Roads
- Transmission lines
- Vegetation treatments (e.g., seeding, thinning)

There are active mining claims for RFFAs in the CIAA. The short-term cumulative effects of the B2H Project crossing the highway, in addition to the past and present actions, would be potentially limiting access to the highway, potential delays for users and/or detours during construction actions, and increased noise during construction. Long-term cumulative effects would include increased industrialization spanning the highway. Cumulative effects for the scenic bikeway also are discussed in Section 3.3.3.12.

Snake River-Mormon Basin Back-Country Byway

The B2H Project would not contribute incrementally to cumulative effects on the Snake River-Mormon Basin Back-Country Byway as the B2H Project would be designed to span the byway; consequently, no permanent infrastructure would be located directly on the byway. Past and present actions in the CIAA for the Snake River-Mormon Basin Back-Country Byway include:

- Active mines (i.e., metals and stone)
- Communication facilities
- Residential and non-residential structures
- Pipeline
- Railroad
- Roads
- Transmission lines
- Vegetation treatments (e.g., seeding, thinning)

There are active mining claims for RFFAs in the CIAA. The short-term cumulative effects of the B2H Project crossing the byway, in addition to the past and present actions, would be potentially limiting access to the byway, potential delays for users and/or detours during construction actions, and increased noise during construction. Long-term cumulative effects would include increased industrialization spanning the byway. Cumulative effects for the scenic bikeway also are discussed in Section 3.3.3.12.

Burnt River Extensive Recreation Management Area

The B2H Project would not contribute incrementally to cumulative effects on the Burnt River ERMA as the B2H Project right-of-way is located in an area that has past and present actions. Past and present actions in the ERMA include:

- Active mines (i.e., geothermal, metals, stone)
- Dams
- Pipelines
- Roads
- Vegetation treatments (e.g., seeding, thinning)

There are active mining claims for RFFAs in the CIAA. The short-term cumulative effects of the B2H Project, past and present actions, and RFFA would potentially limit and/or hinder access to and/or in the ERMA and increase noise during construction. Long-term cumulative effects would include industrial development in the ERMA, which potentially could limit some recreational opportunities.

Virtue Flat OHV Extensive Recreation Management Area

The B2H Project would not contribute incrementally to cumulative effects on the Virtue Flat OHV ERMA as the B2H Project right-of-way is located in an area that has past and present actions. Past and present actions in the ERMA include:

- Active mines (i.e., metals)
- Roads
- Vegetation treatments (e.g., seeding, thinning)

There are active mining claims for RFFAs in the CIAA. The short-term cumulative effects of the B2H Project, past and present actions, and RFFA would potentially limit and/or hinder access to and/or in the ERMA and increase noise during construction. Long-term cumulative effects would include additional industrial development in the ERMA, which potentially could limit some recreational opportunities.

Recreational Trails

The B2H Project would contribute incrementally to cumulative effects on recreational trails as the B2H Project would be designed to span the trails; permanent infrastructure would not be located directly on the trails, but access roads would be permanent. Past and present actions in the area traversed by the recreational trails include:

- Communication tower
- Railroad
- Non-residential structure
- Roads
- Pipeline
- Vegetation treatments (e.g. seeding, thinning)

An RFFA in the area near recreational trails would be the active mining claims. The short-term cumulative effects of the B2H Project crossing recreational trails in addition to the past and present actions and RFFAs would be limited access to the trails during construction, with long-term improved access because of permanent access roads.

Segment 4—Brogan

Recreational Trails

The B2H Project would contribute incrementally to cumulative effects on recreational trails. The B2H Project would be designed to span the trails; permanent infrastructure would not be located directly on the trails, but access roads would be permanent. Past and present actions in the area traversed by the recreational trails include roads and vegetation treatment (e.g., seeding).

There are no RFFAs in the area near recreational trails. The short-term cumulative effects of the B2H Project crossing recreational trails in addition to the past and present actions and RFFAs would include limited access to the trails during construction, but improved access for the long term.

Segment 5—Malheur

Owyhee River Below the Dam Special Recreation Management Area

The B2H Project would contribute incrementally to cumulative effects on the Owyhee River Below the Dam SRMA as the B2H Project right-of-way is located in an area that has past and present actions. Past and present actions in the SRMA include:

- Active mines (i.e., geothermal, metals, stone)
- Campgrounds (developed and dispersed)
- Communication facilities
- Non-residential Building
- Roads
- Transmission lines
- Vegetation treatments
- Pipelines
- Irrigation facilities/infrastructure

There are no RFFAs proposed in the SRMA. The short-term cumulative effects of the B2H Project and past and present actions would potentially limit and/or hinder access to and/or in the SRMA and increase noise during construction. The long-term cumulative effects would be additional industrial development in the SRMA, which potentially could limit some recreational opportunities, reduce the recreational experience, and increase access to the area. Cumulative effects for the Owyhee River Below the Dam ACEC and Owyhee River Below the Dam Suitable Wild and Scenic River are discussed in Sections 3.3.3.6 and 3.3.3.11.

Segment 6—Treasure Valley

Owyhee Extensive Recreation Management Area

The B2H Project would contribute incrementally to cumulative effects on the Owyhee ERMA as the B2H Project right-of-way is located in an area that has past and present actions. Past and present actions in the ERMA include:

- Gateway West Transmission Project
- Active mines (i.e., geothermal, metals, stone, sand and gravel)
- Cemetery
- Communication facilities
- Dams
- Residential and non-residential building
- Railroads
- Roads
- Transmission lines
- Vegetation treatments (e.g., seeding, thinning)

There are active mining claims and planned vegetation treatments (i.e., seeding, chaining, herbicide treatments) for RFFAs in the ERMA. The short-term cumulative effects of the B2H Project, past and present actions, and RFFA would potentially limit and/or hinder access to and/or in the ERMA and increase noise during construction. Long-term cumulative effects would include additional industrial development in the ERMA, which potentially could limit some recreational opportunities and increase access to the area.

Jump Creek Special Recreation Management Area

The B2H Project would contribute incrementally to cumulative effects on the Jump Creek SRMA. The B2H Project right-of-way is located in an area that has past and present actions. Past and present actions in the SRMA include:

- Roads
- Vegetation treatments (e.g., seeding, thinning)

There are planned vegetation treatments (i.e., seeding and chaining) for RFFAs in the SRMA. The short-term cumulative effects of the B2H Project, past and present actions, and RFFA would include potential limitation and/or hindrance of access to and/or in the SRMA and increase noise during construction. Long-term cumulative effects would include additional industrial development in the SRMA, which potentially could limit some recreational opportunities. An additional long-term cumulative effect includes potential for increased access as a result of permanent access roads created for the B2H Project.

Owyhee Front Special Recreation Management Area

The B2H Project would not contribute incrementally to cumulative effects on the Owyhee Front SRMA. The B2H Project right-of-way is located in an area that has past and present actions. Past and present actions in the SRMA include:

- Gateway West Transmission Project
- Active mines (i.e., sand and gravel, minerals)
- Communication facilities
- Dams
- Residential and non-residential building
- Roads
- Transmission lines
- Vegetation treatments (e.g., seeding, thinning)

There are active mining claims and planned vegetation treatments (i.e., seeding) for RFFAs in the SRMA. The short-term cumulative effects of the B2H Project, past and present actions, and RFFA would potentially limit and/or hinder access to and/or in the SRMA and increase noise during construction. Long-term cumulative effects would include increased access from development of permanent access roads, and additional industrial development in the SRMA, which potentially could limit some recreational opportunities.

Squaw Creek Addition Special Recreation Management Area

The B2H Project would contribute incrementally to cumulative effects on the Squaw Creek Addition SRMA. The B2H Project right-of-way is located in an area that has past and present actions. Past and present actions in the SRMA include:

- Active mines (i.e., sand and gravel)
- Communication facilities
- Non-residential building
- Roads
- Transmission lines
- Vegetation treatments (e.g., seeding, thinning)

There are active mining claims and planned vegetation treatments (i.e., seeding) for RFFAs in the SRMA. The short-term cumulative effects of the B2H Project, past and present actions, and RFFA would potentially limit and/or hinder access to and/or in the SRMA and increase noise during construction. Long-term cumulative effects would include increased access from development of permanent access roads, and additional industrial development in the SRMA, which potentially could limit some recreational opportunities.

Recreational Trails

The B2H Project would contribute incrementally to cumulative effects on recreational trails. The B2H Project would be designed to span the trails; consequently, permanent infrastructure would not be

located directly on the trails. Past and present actions in the area traversed by the recreational trails include:

- Mining/extraction
- Roads
- Transmission lines
- Vegetation treatments (e.g. seeding, thinning)

An RFFA in the area near recreational trails would be the active mining claims. The short-term cumulative effects of the B2H Project crossing recreational trails in addition to the past and present actions and RFFAs would be limited access to the trails during construction but improved access for the long term.

3.3.3.9 TRANSPORTATION

This section estimates cumulative effects on transportation from the B2H Project effects in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.9.

The approach for analysis of cumulative effects on transportation, including the geographic and temporal scopes of analysis, is presented in Table 3-638. The cumulative effects analysis for transportation considers direct and indirect impacts from the B2H Project (described in Section 3.2.9) in conjunction with the past and present actions and RFFAs listed in Table 3-639 and Table 3-640.

ISSUES IDENTIFIED FOR ANALYSIS

Issues that have been identified in relation to transportation include concerns that towers would interfere with airport and landing strip operations that roads would be damaged by large construction equipment, and that conflicts between transportation uses and the B2H Project would occur during construction and potentially during operation and maintenance of the B2H Project.

EXISTING CONDITION

Roadways, such as interstates, highways (U.S. and state), and county, local and private roads occur throughout the B2H Project area both parallel to and crossed by the alternative routes. Generally, these roadways are identified as past and present projects with many of the other past and present projects being accessed by the roadways.

Small aviation facilities occur throughout the B2H Project area on public and privately owned lands. Most of the airports are located on the outskirts of their city or town. Airstrips are generally associated with rural development and agricultural operations. These aviation facilities are considered as past and present projects and are associated with other land uses.

The UPRR railroad line occurs throughout the B2H Project area. Similar to roadways and aviation facilities, these railroad lines are considered a past and present project with some of the railroads supporting operations of other past and present projects (i.e., railroads from mines to power plants).

RESULTS BY SEGMENT

Segment 1—Morrow-Umatilla

Highways, Roads, Bridges, Railroads, and Pipelines

Existing roadways would be used to the extent practical to provide access for the B2H Project and RFFAs (as identified in Table 3-640). There would be the potential that existing roadways could be used simultaneously the B2H Project and RFFAs, increasing the use of the roadways beyond localized use. Increased traffic on these existing roadways to access the B2H Project and RFFAs would require increased maintenance and temporary road closures/delays and detours during construction.

Where access to the B2H Project and other RFFAs cannot be gained using existing roadways, new access and/or improved access would occur. In some instances new access and improved access would be used by the B2H Project and RFFAs; however, the practicality of this is not known because the B2H Project typically requires access to all its on-the-ground components (i.e., transmission structures, communication facilities, etc.) for construction, operation, and maintenance. Even though new access developed and existing access improved by the B2H Project and RFFAs would be closed to the public, the potential for unauthorized users to access areas previously inaccessible could result in requirements for additional agency administrative considerations, such as law enforcement, maintenance and associated cost, and emergency response.

The UPRR railroad would be crossed by the B2H Project and some RFFAs (other linear RFFAs are included in Table 3-640). Operations of the railroads could be altered during construction and safety concerns would increase with the location of the B2H Project and RFFAs near the railroad, such as a clearance issue and railroad set-back issues due to limited space. Implementation of the B2H Project and RFFAs also could limit the ability of the railroads to expand/or reroute should the need arise in the future.

Airports, Airstrips and Heliport

Construction of the B2H Project and RFFAs (refer to Table 3-640) with above-ground components, such as the B2H Project, would be constructed considering requirements associated with existing aviation-facility operations. Mostly notably, the past and present development, the B2H Project and RRFAs such as wind farms, transmission lines and communication towers would cumulatively limit airspace availability.

Because of the increased amount of air traffic associated with NWSTF Boardman in the B2H Project study area, the addition of the B2H Project and RFFAs could increase safety concerns associated with operation of aviation facilities and flight paths. The construction and operation of the above-ground utility projects would have cumulative impacts on local aviators, both military and civilian. Each new tower (wind, transmission, and communication) would represent a hazard for aviators to avoid and

could pose a compatibility issue with regards to airspace use and low-flying aircrafts conducting training associated with NWSTF Boardman. However, development within MTRs and special-use airspace is subject to obstruction evaluation/airport airspace analysis in coordination with the FAA. Therefore, cumulative impacts on transportation are not considered significant.

Segment 2—Blue Mountains

Highways, Roads, Bridges, Railroads

Cumulative effects on highways, roads, bridges and railroad facilities in Segment 2 would be the same as those described for Segment 1.

Airports, Airstrips and Heliport

Cumulative effects on airports, airstrips and heliport facilities in Segment 2 would be the same as those described for Segment 1.

Segment 3—Baker Valley

Highways, Roads, Bridges, Railroads, and Pipelines

Cumulative effects on highways, roads, bridges and railroad facilities in Segment 3 would be the same as those described for Segment 1.

Airports, Airstrips and Heliport

Cumulative effects on airports, airstrips and heliport facilities in Segment 3 would be the same as those described for Segment 1.

Segment 4—Brogan

Highways, Roads, Bridges, and Railroads

Cumulative effects on highways, roads, bridges and railroad facilities in Segment 4 would be the same as those described for Segment 1.

Airports, Airstrips and Heliport

Cumulative effects on airports, airstrips and heliport facilities in Segment 4 would be the same as those described for Segment 1.

Segment 5—Malheur

Highways, Roads, Bridges, and Railroads

Cumulative effects on highways, roads, bridges and railroad facilities in Segment 5 would be the same as those described for Segment 1.

Airports, Airstrips and Heliport

Cumulative effects on airports, airstrips and heliport facilities in Segment 5 would be the same as those described for Segment 1.

Segment 6—Treasure Valley

Highways, Roads, Bridges, and Railroads

Cumulative effects on highways, roads, bridges and railroad facilities in Segment 6 would be the same as those described for Segment 1.

Airports, Airstrips and Heliport

Cumulative effects on airports, airstrips and heliport facilities in Segment 6 would be the same as those described for Segment 1.

3.3.3.10 Lands with Wilderness Characteristics

This section estimates cumulative effects from the B2H Project on lands with wilderness characteristics, in addition to past and present actions and other RFFAs. Resources addressed in this section are the same as those addressed in Section 3.2.10.

The cumulative effects analysis for lands with wilderness characteristics considers direct and indirect impacts from the B2H Project (described in Section 3.2.10) in conjunction with the past and present actions and RFFAs listed in Table 3-639 and Table 3-640.

Issues Identified for Analysis

Potential conflicts between management of lands with wilderness characteristics and past and present projects and RFFAs include adversely affecting the wilderness characteristics for which a unit is considered for future wilderness designation (e.g., disrupting the apparent naturalness of the environment, etc.). These conflicts would be intensified where the B2H Project and other future activities or existing activities, or both, are occurring in the same unit.

Existing Condition

Lands with wilderness characteristics only are present in Segment 5 of the B2H Project CIAA. Past and present actions, such as recreational infrastructure, roads, pipelines, transmission lines, etc. have been inventoried in a unit, but the actions were found to be compatible with the wilderness characteristics for which the units were inventoried.

Results

Segment 5—Malheur

Past and present actions in the CIAA for lands with wilderness characteristics within Segment 5 include roads.

RFFAs in the CIAA for lands with wilderness characteristics within Segment 5 include:

- Roads
- Oil and gas development
- Active mining claims

The Double Mountain Unit is the only unit of lands with wilderness characteristics that would be affected by the B2H Project. Variation S5-A2 is the only route variation that crosses the Double Mountain Unit. The Double Mountain Unit is 28,181 acres; the creation of a new unit boundary by this variation would remove 1,890 acres.

Because lands within the Vale District are within the planning area for the SEORMP, the BLM is currently precluded from approving any surface-disturbing activity on lands that the BLM has identified as having wilderness characteristics if the BLM finds that the project would either diminish the size of the inventory unit or cause the entire uninventoried unit to no longer meet the criteria for wilderness characteristics (Oregon Natural Desert Association v. Bureau of Land Management 2010).

Past and present actions, such as recreational infrastructure, which only include roads for the Double Mountain Unit, have been inventoried in a unit, but the actions were found to be compatible with the wilderness characteristics for which the units were inventoried.

Therefore, effects of the B2H Project in addition to RFFAs would be minimal. The RFFAs listed above would be subject to the management decision of whether to protect land or not protect, or manage for other uses with wilderness characteristics.

3.3.3.11 Potential Congressional Designations

The cumulative effects analysis for potential congressional designations considers direct and indirect impacts from the B2H Project (described in Section 3.2.11) in conjunction with the past and present actions listed in Table 3-639.There were no RFFAs identified within the CIAA for potential congressional designations.

Issues Identified for Analysis

The potential cumulative effects on the Owyhee River Below the Dam suitable WSR segment include impairment of its tentative recreational classification and outstandingly remarkable values. This is the only potential congressional designation that could be affected by the B2H Project.

Existing Condition

A potential congressional designation only is present in Segment 5 of the B2H Project CIAA. Past and present actions occur on or near the Owyhee River Below the Dam suitable WSR in the CIAA. The natural environment has been altered in a way that allows for past and present actions, such as recreational infrastructure, roads, transmission lines, etc., but is still compatible with the tentative classification and outstandingly remarkable values for which the potential congressional designation may be designated. Refer to Section 3.2.11 for additional information.

Results

Segment 5—Malheur

Owyhee River Below the Dam Suitable Wild and Scenic River Segment

Past and present actions that occur in the CIAA for the suitable WSR segment include:

- Residential and non-residential structures
- Numerous campgrounds (developed and dispersed)
- Roads
- One 500-kV transmission line

There are no RFFAs proposed or planned in the CIAA for the Owyhee River Below the Dam Suitable WSR segment. Cumulative effects on the Owyhee River Below the Dam suitable WSR would be the same as the effects described for the environmental consequences in Section 3.2.11.

3.3.3.12 Visual Resources

This section estimates cumulative effects on visual resources considering the B2H Project effects (described in 3.2.12) in addition to past and present actions and other RFFAs listed in Table 3-640 and Table 3-639. Cumulative effects on visual resources would result through the incremental modification of scenic quality and views through development of past and present actions and RFFAs. The approach for analysis of cumulative effects on visual resources, including the geographic and temporal scopes of analysis, is presented in Table 3-638.

Issues Identified for Analysis

Cumulative effects on visual resources include impacts on scenic quality as well as on views from sensitive viewing platforms. The following discussion summarizes the types of issues relevant to cumulative effects on visual resources.

Scenic Quality

A cumulative effects on scenic quality would result from the industrialization of natural-appearing landscapes through the construction of multiple projects and the alteration of the existing landscape's characteristics, including landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. In general, those areas where modifications already exist (i.e., existing pipelines, transmission lines, or any other existing utility corridors) effects would be reduced through colocation of the B2H Project.

Sensitive Viewing Platforms

Cumulative effects would occur where viewers would perceive the alteration of the landscape components of landform, vegetation, and structure through the introduction of the B2H Project in addition to existing disturbances and RFFAs. Multiple transmission lines and/or other energy facilities (e.g., wind farms) seen in context with the B2H Project would dominate views from sensitive viewing platforms.

Existing Condition

Development occurs throughout the B2H Project area, including agricultural and community development, wind farms, transmission lines, pipelines, mining operations, and networks of paved, gravel, and two-track roads. In Segment 1, the area west of the Blue Mountains has been modified by

agricultural and community development with wind farms and other energy-based development locally dominating the landscape. Toward the end of Segment 1 and the start of Segment 2 in the Blue Mountains, development is mostly limited to existing utilities and I-84. Development south of La Grande, in Segment 2, is mostly associated with agricultural and community development in Grande Ronde and North Powder valleys. The routes in Segment 3, near Baker City, traverse landscapes modified by community and agricultural development as well as locally modified by an existing transmission line and I-84. An existing windfarm is located on the northern end of Segment 3 where the Timber Canyon Alternative separates from the alignments of the other B2H Project alternatives. The setting along the Timber Canyon Alternative is more intact except for agricultural development near the community of Richland. North of Huntington and near Farewell Bend, in Segment 4, the visual setting has been modified by an existing 138-kV transmission line, I-84, and existing wind farms. Before reaching Willow Creek Valley, modified by agricultural development and an existing transmission line, the alternatives traverse a highly intact landscape setting north of Tub Mountain. Along Segment 5, the B2H Project alternatives cross intact landscape settings except for the Malheur A and Malheur S Alternatives which parallel an existing 500-kV transmission line across the Owyhee River to the Idaho-Oregon border. The alternatives in Segment 6 continue to parallel this existing transmission line to the Hemingway Substation at the edge of Treasure Valley, which has been largely converted to agricultural uses.

RESULTS BY SEGMENT

Cumulative effects on scenic quality were assessed on the B2H Project's VAUs, similar to direct B2H Project effects. However instead of clipping the units to the study boundary, the units were extended to encompass the entire landscape to assess cumulative effects on a complete landscape unit. In order to determine the extent of influence from past projects, present projects, and RFFAs on scenery, an influence buffer was run from each project (e.g., 5 miles for the B2H Project). By combining these buffers, the extent of each VAU modified by past, present, and future development and the B2H Project specifically, the relative level of cumulative effects was determined. A summary table is located in the following section, for each B2H Project segment, providing a quantification of cumulative effects for all VAUs affected by a particular alternative or route variations. This table includes the following seven columns describing the (1) total available resource, (2) past and present development, (3) RFFAs, (4) incremental project development, (5) estimated cumulative development, (6) remaining available resource, and (7) percentage of VAUs not influenced by development. The total available resource is the total acreage of the complete VAU, establishing the area potentially affected by past, present, and RFFAs. The area influenced by past and present development and RFFAs are the next two columns in the cumulative effect tables, establishing the areas potentially modified even if the B2H Project No Action Alternative was selected. Incremental project development introduces the area influenced by different B2H Project alternatives and route variations within the VAUs. The last three columns in the cumulative effect tables provide the total area occupied by past, present, and RFFAs (including the B2H Project), the extent of the VAUs not influenced by development, and the percentage of the VAUs area not influenced by development. The following narratives focus on those VAUs where cumulative

effects include additional influence from RFFAs in addition to the B2H Project-associated impacts described in Section 3.2.12.

Cumulative effects on views from sensitive viewing platforms were assessed using the results from Section 3.2.12, to determine the influence of past and present development and the incremental B2H Project effects, in context with RFFAs. The levels of direct and cumulative impacts are categorized as high, moderate, or low based on the same thresholds defined in Section 3.2.12. The cumulative effects on each KOP are documented in a table for each B2H Project segment with an impact level associated with, (1) the influence of past and present development, (2) the influence of RFFAs, (3) the incremental influence of project development, by alternative, and (4) the overall estimated influence of cumulative development on the KOP's viewshed. The impact level associated with past and present development on sensitive viewing platforms was determined through reviewing the types of development and extent of existing development adjacent sensitive viewing platforms as described in the affected environment. The influence of RFFAs was completed by assessing the type of project (e.g., wind farm, transmission line, etc.) and its ability to influence views from each KOP. The incremental influence of the B2H Project is the same impact level assigned for direct project effects as assessed in Section 3.2.12). Based on the development of past and present actions, and RFFAs, including the B2H Project, an overall estimated influence of cumulative development was determined based on the highest level of impact, if either a past or present action, RFFA, or the B2H Project was the primary cumulative effect, or where the effects were additive, the resulting cumulative effect from all actions was assessed. In addition to the results in a tabular format, the following narratives summarize the KOPs where the additional influence from RFFAs, in addition to the B2H Project-associated impacts described in Section 3.2.12, increases overall cumulative effects.

Segment 1—Morrow-Umatilla

Scenic Quality

Table 3-776. Cumulative Effects Summary for Scenic Quality in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	2,150,800	1,473,300	65,700	127,200	1,666,200	484,600	22.5
Variation S1-B1	*710,300*	*249,700*	*0*	*35,000*	*284,700*	*425,600*	*59.9*
Variation S1-B2	*710,300*	*249,700*	*0*	*35,000*	*284,600*	*425,700*	*59.9*
East of Bombing Range Road	2,150,800	1,473,300	65,700	127,200	1,666,200	484,600	22.5

Table 3-776. Cumulative Effects Summary for Scenic Quality in Segment 1—Morrow-Umatilla in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action – Southern Route	2,175,200	1,473,300	65,700	186,200	1,725,200	450,000	20.7
West of Bombing Range Road – Southern Route	2,218,900	1,473,900	67,600	185,900	1,727,300	491,600	22.2
Longhorn	2,150,800	1,473,300	65,700	127,200	1,666,200	484,600	22.5
Interstate 84	2,007,700	1,385,000	13,500	113,000	1,511,500	496,200	24.7
Variation S1-A1	*1,121,500*	*1,033,800*	*6,800*	*15,600*	*1,056,200*	*65,300*	*5.8*
Variation S1-A2	*1,121,500*	*1,033,800*	*6,800*	*19,400*	*1,060,000*	*61,500*	*5.5*
Interstate 84 – Southern Route	2,032,000	1,385,000	13,500	174,9003	1,573,400	458,700	22.6
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

The following VAUs would be further influenced by RFFAs and the B2H Project, in addition to past and present actions.

Butler Creek VAU:

The Butler Creek VAU has been largely converted to agricultural land uses in its lower reaches whereas the upper portions of the VAU are more natural in appearance. Additionally the existing Services Butte and Oregon wind farms, located adjacent to the VAU, have influenced the setting within this VAU. The addition of the proposed Buttercreek and Wheatridge wind farms would further influence the VAU and locally dominate the setting through the presence of tall wind turbines in the landscape setting. The incremental effect introduced by the B2H Project would further modify the landscape and where sited near existing or proposed wind farms, the landscape would be dominated by energy-related development.

Coombs VAU:

The setting in the Coombs VAU has been modified by dryland agricultural uses located at the margins of the landscape as well as the Services Butte Wind Farm, which dominates the western portion of the landscape through the presence of the tall, vertical wind turbine structures. The addition of the proposed Wheatridge Wind Farm would intensify cumulative effects in the western portion of the VAU through the proliferation of wind farm development. The B2H Project would further intensify these effects except for the alternatives paralleling I-84 which would influence the VAU along its northern and

eastern portions which are more intact, leading to an expansion of lands modified by development in this landscape.

Longhorn VAU:

The Longhorn VAU is characterized by the flat expansive plains near the Columbia River which have been mostly converted to agricultural uses as well as containing several communities, including Hermiston and Boardman. Additionally, this landscape has been modified by military facilities, existing transmission lines, interstate highways, and wind farms which each locally dominate the landscape setting. The addition of the proposed Buttercreek and Wheatridge wind farms would lead to the western portion of this VAU becoming dominated by energy development. The B2H Project would intensify these effects where sited adjacent to other past, present, and future energy projects in the western and northern portions of this landscape, and where the setting is more intact in the east along I-84, expand the area viewed as modified by development.

Matlock VAU:

The setting in the Matlock VAU is generally intact with limited past and present development except for dryland agriculture along its northern margin and U.S. and state highways traversing the landscape's rolling terrain. The presence of wind farm development north of the VAU influences the setting along the northern edge of the landscape but does not dominate the landscape's character. The addition of the proposed Wheatridge Wind Farm into this VAU would locally dominate the setting in the western portion of this VAU through the presence of tall, vertical wind turbine structures. The B2H Project would have limited additive cumulative effects on this VAU along its northern margin, adjacent to past, present, and future actions, except the alternatives along the southern option, which cross the VAU and locally dominate the setting where the setting is currently more intact.

Note, the Blue Mountains Rocky Ridge, Columbia River Valley, Coombs, Longhorn, McKay, Spring Hollow, and Umatilla River VAUs, through past and present actions as well as the B2H Project and RFFAs, could become almost completely visually influenced by development.

Sensitive Viewing Platforms

Table 3-777. Cumulative Effects on Sensitive Viewing Platforms for Segment 1—Morrow-Umatilla

Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Stationary Sensitive Viewing Platforms				
2-16 Lindsay Prairie Preserve				
Applicant's Proposed Action	Low	High	Low	High
East of Bombing Range Road	Low	High	Low	High
Applicant's Proposed Action – Southern Route	Low	High	Low	High
West of Bombing Range Road – Southern Route	Low	High	Moderate	High

Table 3-777. Cumulative Effects on Sensitive Viewing Platforms for Segment 1—Morrow-Umatilla				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
2-17 Boardman Research Natural Area - Bombing Range Road				
Applicant's Proposed Action	Moderate	Moderate	Moderate	Moderate
East of Bombing Range Road	Moderate	Moderate	High	High
Applicant's Proposed Action – Southern Route	Moderate	Moderate	Moderate	Moderate
West of Bombing Range Road – Southern Route	Moderate	Moderate	Moderate	Moderate
2-20 Butter Creek Community				
Applicant's Proposed Action	Low	Not applicable	High	High
East of Bombing Range Road	Low	Not applicable	High	High
Applicant's Proposed Action – Southern Route	Low	Not applicable	High	High
West of Bombing Range Road – Southern Route	Low	Not applicable	Low	Low
Longhorn	Low	Not applicable	High	High
2-23 Wilson Lane Southeast				
Applicant's Proposed Action	Low	Not applicable	High	High
East of Bombing Range Road	Low	Not applicable	High	High
Applicant's Proposed Action – Southern Route	Low	Not applicable	High	High
West of Bombing Range Road – Southern Route	Low	Not applicable	High	High
Longhorn	Low	Not applicable	Low	Low
Interstate 84	Low	Not applicable	Low	Low
Interstate 84 – Southern Route	Low	Not applicable	Low	Low
3-3 Blue Mountain Forest State Scenic Corridor–Interstate 84				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
East of Bombing Range Road	Moderate	Not applicable	Moderate	Moderate
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Moderate	Moderate
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Moderate	Moderate
Longhorn	Moderate	Not applicable	Moderate	Moderate
Interstate 84	Moderate	Not applicable	Moderate	Moderate
Interstate 84 – Southern Route	Moderate	Not applicable	Moderate	Moderate
3-9 City of Hermiston				
Interstate 84	Moderate	Low	Low	Moderate
Interstate 84 – Southern Route	Moderate	Low	Low	Moderate
3-12 Pilot Rock Community				
Applicant's Proposed Action	Low	Not applicable	Low	Low
East of Bombing Range Road	Low	Not applicable	Low	Low
Applicant's Proposed Action – Southern Route	Low	Not applicable	Low	Low
Longhorn	Low	Not applicable	Low	Low
Interstate-84	Low	Not applicable	Low	Low
Interstate 84 – Southern Route	Low	Not applicable	Low	Low

Table 3-777. Cumulative Effects on Sensitive Viewing Platforms for Segment 1—Morrow-Umatilla

Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
3-16 Emigrant Springs State Heritage Area				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
East of Bombing Range Road	Moderate	Not applicable	Low	Moderate
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Low	Moderate
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Low	Moderate
Longhorn	Moderate	Not applicable	Low	Moderate
Interstate-84	Moderate	Not applicable	Low	Moderate
Interstate-84 – Southern Route	Moderate	Not applicable	Low	Moderate
3-20 McKay Creek National Wildlife Refuge–Boat Launch				
East of Bombing Range Road	Low	Not applicable	Low	Low
Longhorn	Low	Not applicable	Low	Low
Interstate-84	Low	Not applicable	Low	Low
3-21 McKay Creek National Wildlife Refuge–Spring Creek Road				
East of Bombing Range Road	Low	Not applicable	Low	Low
Longhorn	Low	Not applicable	Low	Low
Interstate-84	Low	Not applicable	Low	Low
3-24 Meacham Divide Nordic Skiing Area				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S1-B1	*Low*	*Not applicable*	*Low*	*Low*
Variation S1-B2	*Low*	*Not applicable*	*Low*	*Low*
East of Bombing Range Road	Low	Not applicable	Low	Low
Applicant's Proposed Action – Southern Route	Low	Not applicable	Low	Low
West of Bombing Range Road – Southern Route	Low	Not applicable	Low	Low
Longhorn	Low	Not applicable	Low	Low
Interstate-84	Low	Not applicable	Low	Low
Interstate-84 – Southern Route	Low	Not applicable	Low	Low
3-39 Community of Stanfield				
Interstate-84	Moderate	Low	Moderate	Moderate
Variation S1-A1	*Moderate*	*Low*	*Moderate*	*Moderate*
Variation S1-A2	*Moderate*	*Low*	*Moderate*	*Moderate*
Interstate-84 – Southern Route	Moderate	Low	Moderate	Moderate
3-40 Community of Echo				
East of Bombing Range Road	Moderate	Not applicable	Low	Moderate
Interstate-84	Moderate	Not applicable	Low	Moderate
Variation S1-A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S1-A2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Interstate-84 – Southern Route	Moderate	Not applicable	Low	Moderate

Table 3-777. Cumulative Effects on Sensitive Viewing Platforms for Segment 1—Morrow-Umatilla				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
3-41 City of Pendleton				
Interstate-84	Moderate	Not applicable	Low	Moderate
Variation S1-A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Interstate-84 – Southern Route	Moderate	Not applicable	Low	Moderate
4-4 Blue Mountain Crossing Sno–Park				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S1-B1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S1-B2	*Low*	*Not applicable*	*Low*	*Low*
East of Bombing Range Road	Low	Not applicable	Moderate	Moderate
Applicant's Proposed Action – Southern Route	Low	Not applicable	Moderate	Moderate
West of Bombing Range Road – Southern Route	Low	Not applicable	Moderate	Moderate
Longhorn	Low	Not applicable	Moderate	Moderate
Interstate-84	Low	Not applicable	Moderate	Moderate
Interstate-84 – Southern Route	Low	Not applicable	Moderate	Moderate
4-5 Blue Mountain Forest State Scenic Corridor–Old Emigrant Hill Scenic Frontage Road				
Applicant's Proposed Action	Low	Not applicable	High	High
Variation S1-B1	*Low*	*Not applicable*	*High*	*High*
Variation S1-B2	*Low*	*Not applicable*	*Low*	*Low*
East of Bombing Range Road	Low	Not applicable	High	High
Applicant's Proposed Action – Southern Route	Low	Not applicable	High	High
West of Bombing Range Road – Southern Route	Low	Not applicable	High	High
Longhorn	Low	Not applicable	High	High
Interstate-84	Low	Not applicable	High	High
Interstate-84 – Southern Route	Low	Not applicable	High	High
4-6 Blue Mountain Forest State Scenic Corridor–Summit Rd (Exit 243)				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S1-B1	*Low*	*Not applicable*	*Low*	*Low*
Variation S1-B2	*Low*	*Not applicable*	*Low*	*Low*
East of Bombing Range Road	Low	Not applicable	Low	Low
Applicant's Proposed Action – Southern Route	Low	Not applicable	Low	Low
West of Bombing Range Road – Southern Route	Low	Not applicable	Low	Low
Longhorn	Low	Not applicable	Low	Low
Interstate-84	Low	Not applicable	Low	Low
Interstate-84 – Southern Route	Low	Not applicable	Low	Low
4-32 Oregon Trail Interpretive Park Picnic Area				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
Variation S1-B1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S1-B2	*Moderate*	*Not applicable*	*High*	*High*

Table 3-777. Cumulative Effects on Sensitive Viewing Platforms for Segment 1—Morrow-Umatilla

Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
East of Bombing Range Road	Moderate	Not applicable	Moderate	Moderate
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Moderate	Moderate
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Moderate	Moderate
Longhorn	Moderate	Not applicable	Moderate	Moderate
Interstate-84	Moderate	Not applicable	Moderate	Moderate
Interstate-84 – Southern Route	Moderate	Not applicable	Moderate	Moderate
4-33 Blue Mountain Forest Double Parking Lot				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
Variation S1-B1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S1-B2	*Moderate*	*Not applicable*	*High*	*High*
East of Bombing Range Road	Moderate	Not applicable	Moderate	Moderate
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Moderate	Moderate
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Moderate	Moderate
Longhorn	Moderate	Not applicable	Moderate	Moderate
Interstate-84	Moderate	Not applicable	Moderate	Moderate
Interstate-84 – Southern Route	Moderate	Not applicable	Moderate	Moderate
4-40 Spring Creek U.S. Forest Service Campground				
Applicant's Proposed Action	Low	Not applicable	High	High
Variation S1-B1	*Low*	*Not applicable*	*High*	*High*
Variation S1-B2	*Low*	*Not applicable*	*Moderate*	*Moderate*
East of Bombing Range Road	Low	Not applicable	High	High
Applicant's Proposed Action – Southern Route	Low	Not applicable	High	High
West of Bombing Range Road – Southern Route	Low	Not applicable	High	High
Longhorn	Low	Not applicable	High	High
Interstate-84	Low	Not applicable	High	High
Interstate-84 – Southern Route	Low	Not applicable	High	High
Linear Sensitive Viewing Platforms				
Interstate 82				
Interstate-84	Moderate	Low	Low	Moderate
Interstate-84 – Southern Route	Moderate	Low	Low	Moderate
Interstate 84				
Applicant's Proposed Action	Low	Low	Moderate	Moderate
Variation S1-B1	*Low*	*Low*	*Moderate*	*Moderate*
Variation S1-B2	*Low*	*Low*	*High*	*High*
East of Bombing Range Road	Low	Low	Moderate	Moderate
Applicant's Proposed Action – Southern Route	Low	Low	*Moderate*	*Moderate*
West of Bombing Range Road – Southern Route	Low	Low	Moderate	Moderate
Longhorn	Low	Low	Moderate	Moderate

Table 3-777. Cumulative Effects on Sensitive Viewing Platforms for Segment 1—Morrow-Umatilla				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Interstate-84	Low	Low	Moderate	Moderate
Variation S1-A1	*Low*	*Low*	*High*	*High*
Variation S1-A2	*Low*	*Low*	*Moderate*	*Moderate*
Interstate-84 – Southern Route	Low	Low	Moderate	Moderate
Lewis and Clark Scenic Byway				
Applicant's Proposed Action	Low	Not applicable	Low	Low
East of Bombing Range Road	Low	Not applicable	Low	Low
Applicant's Proposed Action – Southern Route	Low	Not applicable	Low	Low
West of Bombing Range Road – Southern Route	Low	Not applicable	Low	Low
Longhorn	Low	Not applicable	Low	Low
Interstate-84	Low	Not applicable	Low	Low
Interstate-84 – Southern Route	Low	Not applicable	Low	Low
State Highway 244				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S1-B1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S1-B2	*Moderate*	*Not applicable*	*Low*	*Moderate*
East of Bombing Range Road	Moderate	Not applicable	Low	Moderate
Applicant's Proposed Action – Southern Route	Moderate	Not applicable	Low	Moderate
West of Bombing Range Road – Southern Route	Moderate	Not applicable	Low	Moderate
Longhorn	Moderate	Not applicable	Low	Moderate
Interstate-84	Moderate	Not applicable	Low	Moderate
Interstate-84 – Southern Route	Moderate	Not applicable	Low	Moderate
State Highway 74				
Applicant's Proposed Action	Low	Low	Low	Low
East of Bombing Range Road	Low	Low	Low	Low
Applicant's Proposed Action – Southern Route	Low	Low	Low	Low
West of Bombing Range Road – Southern Route	Low	Low	High	High
Longhorn	Low	Low	Low	Low
Interstate-84 – Southern Route	Low	Low	Low	Low
State Highway 207				
Applicant's Proposed Action	Low	High	High	High
East of Bombing Range Road	Low	High	High	High
Applicant's Proposed Action – Southern Route	Low	High	High	High
West of Bombing Range Road – Southern Route	Low	High	High	High
Longhorn	Low	High	High	High
Interstate-84	Low	High	Moderate	High
Interstate-84 – Southern Route	Low	High	Moderate	High

Table 3-777. Cumulative Effects on Sensitive Viewing Platforms for Segment 1—Morrow-Umatilla				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
U.S. Highway 395				
Applicant's Proposed Action	Low	Not applicable	High	High
East of Bombing Range Road	Low	Not applicable	High	High
Applicant's Proposed Action – Southern Route	Low	Not applicable	High	High
West of Bombing Range Road – Southern Route	Low	Not applicable	High	High
Longhorn	Low	Not applicable	High	High
Interstate-84	Low	Not applicable	High	High
Variation S1-A1	*Low*	*Not applicable*	*High*	*High*
Variation S1-A2	*Low*	*Not applicable*	*High*	*High*
Interstate-84 – Southern Route	Low	Not applicable	High	High
U.S. Forest Road 21				
Applicant's Proposed Action	Low	Not applicable	High	High
Variation S1-B1	*Low*	*Not applicable*	*High*	*High*
Variation S1-B2	*Low*	*Not applicable*	*High*	*High*
East of Bombing Range Road	Low	Not applicable	High	High
Applicant's Proposed Action – Southern Route	Low	Not applicable	High	High
West of Bombing Range Road – Southern Route	Low	Not applicable	High	High
Longhorn	Low	Not applicable	High	High
Interstate-84	Low	Not applicable	High	High
Interstate-84 – Southern Route	Low	Not applicable	High	High

The following KOPs would be further influenced by RFFAs and the B2H Project, in addition to past and present actions.

KOP 2-16 Lindsay Prairie Preserve

Views from this KOP are generally intact except for views of an existing 69-kV transmission line to the west, approximately 0.5 mile away, and the lands adjacent to the KOP being converted to dryland agricultural uses. The introduction of the proposed Wheatridge Wind Farm directly adjacent to this KOP would dominate the setting through the presence of tall wind turbines in this flat to rolling agricultural landscape. Additionally, the development of the B2H Project along the West of Bombing Range Road – Southern Route Alternative would lead to further dominance of the viewshed through unobstructed views of skylined transmission line structures.

KOP 2-17 Boardman Research Natural Area - Bombing Range Road

Views from this KOP have been modified by irrigated agricultural uses to the east and the naval bombing range and existing 69-kV transmission line to the west. The introduction of the proposed Buttercreek and Wheatridge wind farms would further modify these views but due to the distance from the KOP, would not dominate the viewshed. The B2H Project, along the West of Bombing Range Road

alternative routes, would intensify cumulative effects but since the B2H Project would replace the existing 69-kV transmission line, these effects would be less intense than if the B2H Project were constructed along the east side of Bombing Range Road. This would result in a tunnel-effect of two transmission lines along the road dominating the KOP's viewshed.

State Highway 207

Traveling southbound on State Highway 207, views are first dominated by urban development in Hermiston which gives way to expansive irrigated agricultural land uses south of Hermiston to the community of Butter Creek 15 miles to the south. Existing wind farms north of Butter Creek locally dominate the setting as viewed from the highway in an area largely converted to agricultural use. Southwest of Butter Creek, the setting becomes more intact with dryland agriculture interspersed with natural, arid grasslands. The addition of the proposed Buttercreek Wind Farm would dominate views southwest of Butter Creek by expanding the area modified by energy development into areas currently viewed as intact. The introduction of the B2H Project on the I-84 alternative routes would intensify cumulative effects adjacent to an existing transmission line and interstate highway in an area of intense agricultural development south of Hermiston. Other B2H Project alternative routes cross the highway adjacent to the proposed Buttercreek Wind Farm where travelers would experience continuous, head-on, skylined views of the B2H Project intensifying views of energy-based development in a previously natural setting.

Segment 2—Blue Mountains

Scenic Quality

Table 3-778. Cumulative Effects Summary for Scenic Quality in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	1,581,300	869,700	0	71,900	941,700	639,700	40.5
Variation S2-A1	*573,200*	*174,300*	*0*	*22,900*	*197,200*	*376,000*	*65.6*
Variation S2-A2	*573,200*	*174,300*	*0*	*22,700*	*197,000*	*376,200*	*65.6*
Variation S2-B1	*1,168,500*	*643,100*	*0*	*27,000*	*670,100*	*498,400*	*42.7*
Variation S2-B2	*1,168,500*	*643,100*	*0*	*27,600*	*670,700*	*497,800*	*42.6*
Variation S2-C1	*1,168,500*	*643,100*	*0*	*46,500*	*689,700*	*478,800*	*41.0*
Variation S2-C2	*1,168,500*	*643,100*	*0*	*40,200*	*683,300*	*485,200*	*41.5*
Variation S2-E1	*1,284,200*	*759,300*	*0*	*20,900*	*780,200*	*504,000*	*39.2*
Variation S2-E2	*1,284,200*	*759,300*	*0*	*20,800*	*780,100*	*504,000*	*39.3*
Variation S2-F1	*1,569,200*	*861,000*	*0*	*14,800*	*875,800*	*693,400*	*44.2*
Variation S2-F2	*1,569,200*	*861,000*	*0*	*13,800*	*874,800*	*694,400*	*44.3*

Table 3-778. Cumulative Effects Summary for Scenic Quality in Segment 2—Blue Mountains in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Glass Hill	1,581,300	869,700	0	76,500	946,200	635,100	40.2
Variation S2-D1	*1,168,500*	*643,100*	*0*	*44,900*	*688,000*	*480,500*	*41.1*
Variation S2-D2	*1,168,500*	*643,100*	*0*	*45,900*	*689,000*	*479,500*	*41.0*
Mill Creek	1,581,300	869,700	0	57,600	927,300	654,000	41.4
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

There are no identified RFFAs within the geographic area of influence within this segment that would potentially affect visual resources. Therefore there would be no incremental effects on scenic quality in addition to those described in Section 3.2.12. Note, the Baker Valley, Grande Ronde Valley, and Pyles Canyon and Thief Valley VAUs, through past and present actions as well as the B2H Project, could become almost completely visually influenced by development.

Sensitive Viewing Platforms

Table 3-779. Cumulative Effects on Sensitive Viewing Platforms for Segment 2—Blue Mountains				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Stationary Sensitive Viewing Platforms				
4-3 Bird Track Springs U.S. Forest Service Campground				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S2-A1	*Low*	*Not applicable*	*Not applicable*	*Low*
Variation S2-A2	*Low*	*Not applicable*	*Not applicable*	*Low*
Variation S2-B1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-B2	*Low*	*Not applicable*	*Not applicable*	*Low*
Glass Hill	Low	Not applicable	Low	Low
Mill Creek	Low	Not applicable	Low	Low
4-10 City of North Powder				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S2-F1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-F2	*Low*	*Not applicable*	*Low*	*Low*
Glass Hill	Low	Not applicable	Low	Low
4-17 Grande Tour Oregon Tour Route–Thief Valley Reservoir				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S2-F2	*Low*	*Not applicable*	*Low*	*Low*
Mill Creek	Low	Not applicable	Low	Low

Table 3-779. Cumulative Effects on Sensitive Viewing Platforms for Segment 2—Blue Mountains				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
4-19 Hilgard Junction State Park				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S2-A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-A2	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-C2	*Low*	*Not applicable*	*Low*	*Low*
Glass Hill	Low	Not applicable	Low	Low
Mill Creek	Low	Not applicable	Moderate	Moderate
4-26 Ladd Marsh Wildlife Area–Foothill Road				
Applicant's Proposed Action	Moderate	Not applicable	High	High
4-28 Morgan Lake Park				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S2-A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-B1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-B2	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-C1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-C2	*Low*	*Not applicable*	*High*	*High*
Glass Hill	Low	Not applicable	Not applicable	Low
Mill Creek	Low	Not applicable	Not applicable	Low
4-32 Oregon Trail Interpretive Park Picnic Area				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S2-A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S2-A2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Glass Hill	Moderate	Not applicable	Low	Moderate
Mill Creek	Moderate	Not applicable	Low	Moderate
4-33 Blue Mountain Forest Double Parking Lot				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S2-A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S2-A2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Glass Hill	Moderate	Not applicable	Low	Moderate
Mill Creek	Moderate	Not applicable	Low	Moderate
4-40 Spring Creek U.S. Forest Service Campground				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S2-A1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-A2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Glass Hill	Low	Not applicable	Moderate	Moderate
Mill Creek	Low	Not applicable	Moderate	Moderate
4-51 City of La Grande				
Variation S2-C2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Mill Creek	Moderate	Not applicable	High	High

Table 3-779. Cumulative Effects on Sensitive Viewing Platforms for Segment 2—Blue Mountains				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
4-55 Elk Song Ranch				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S2-C1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-C2	*Low*	*Not applicable*	*High*	*High*
Mill Creek	Low	Not applicable	Low	Low
5-36 Powder River Wild and Scenic River Corridor–Thief Valley Reservoir Road				
Variation S2-F2	*Low*	*Not applicable*	*Low*	*Low*
Mill Creek	Low	Not applicable	Low	Low
Linear Sensitive Viewing Platforms				
Hells Canyon				
Variation S2-C2	*Low*	*Not applicable*	*Low*	*Low*
Mill Creek	Low	Not applicable	Low	Low
Grande Tour Route				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S2-C1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-C2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-F1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-F2	*Low*	*Not applicable*	*Low*	*Low*
Glass Hill	Low	Not applicable	Moderate	Moderate
Mill Creek	Low	Not applicable	Low	Low
Grand Tour Scenic Bikeway				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S2-C1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-C2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-F1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-F2	*Low*	*Not applicable*	*Low*	*Low*
Glass Hill	Low	Not applicable	Moderate	Moderate
Mill Creek	Low	Not applicable	Low	Low
Powder River Wild and Scenic River/Thief Valley Road				
Variation S2-F2	*Low*	*Not applicable*	*Low*	*Low*
Interstate 84				
Applicant's Proposed Action	Low	Not applicable	High	High
Variation S2-A1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-A2	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-B1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-B2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-C1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-C2	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-E1	*Low*	*Not applicable*	*Moderate*	*Moderate*

Table 3-779. Cumulative Effects on Sensitive Viewing Platforms for Segment 2—Blue Mountains				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Variation S2-E2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-F1	*Low*	*Not applicable*	*High*	*High*
Variation S2-F2	*Low*	*Not applicable*	*High*	*High*
Glass Hill	Low	Not applicable	Low	Low
Mill Creek	Low	Not applicable	Not applicable	Low
State Highway 203				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S2-C1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-C2	*Low*	*Not applicable*	*Low*	*Low*
Glass Hill	Low	Not applicable	Low	Low
Mill Creek	Low	Not applicable	Moderate	Moderate
State Highway 244				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
Variation S2-A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S2-A2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S2-B1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-B2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Glass Hill	Moderate	Not applicable	High	High
Mill Creek	Moderate	Not applicable	High	High
U.S. Forest Service Road 21				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S2-A1	*Low*	*Not applicable*	*High*	*High*
Variation S2-A2	*Low*	*Not applicable*	*High*	*High*
Variation S2-B1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S2-B2	*Low*	*Not applicable*	*Low*	*Low*
Glass Hill	Low	Not applicable	High	High
Mill Creek	Low	Not applicable	High	High
U.S. Forest Service Road 43 – Ladd Canyon Road				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S2-C1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-C2	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-E1	*Low*	*Not applicable*	*Low*	*Low*
Variation S2-E2	*Low*	*Not applicable*	*Low*	*Low*
Glass Hill	Low	Not applicable	High	High
Mill Creek	Low	Not applicable	High	High

There are no identified RFFAs within the geographic area of influence within this segment that would potential affect visual resources. Therefore there would be no incremental effects on sensitive viewing platforms in addition to those described in Section 3.2.12.

Segment 3—Baker Valley

Scenic Quality

Table 3-780. Cumulative Effects Summary for Scenic Quality in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	1,334,900	740,900	0	102,500	843,400	491,500	36.8
Variation S3-A1	*897,700*	*580,200*	*0*	*3,200*	*583,500*	*314,200*	*35.0*
Variation S3-A2	*897,700*	*580,200*	*0*	*3,300*	*583,500*	*314,200*	*35.0*
Variation S3-B1	*996,900*	*607,200*	*0*	*35,900*	*643,200*	*353,700*	*35.5*
Variation S3-B2	*999,300*	*609,700*	*0*	*32,100*	*641,800*	*357,500*	*35.8*
Variation S3-B3	*999,300*	*609,700*	*0*	*32,500*	*642,200*	*357,100*	*35.7*
Variation S3-B4	*999,300*	*609,700*	*0*	*31,900*	*641,600*	*357,800*	*35.8*
Variation S3-B5	*999,300*	*609,700*	*0*	*31,500*	*641,200*	*358,100*	*35.8*
Variation S3-C1	*889,200*	*494,000*	*0*	*63,000*	*557,000*	*332,200*	*37.4*
Variation S3-C2	*889,200*	*494,000*	*0*	*65,200*	*559,200*	*330,000*	*37.1*
Variation S3-C3	*889,200*	*494,000*	*0*	*63,900*	*557,900*	*331,400*	*37.3*
Variation S3-C4	*889,200*	*494,000*	*0*	*65,400*	*559,400*	*329,800*	*37.1*
Variation S3-C5	*889,200*	*494,000*	*0*	*68,500*	*562,500*	*326,700*	*36.7*
Variation S3-C6	*918,600*	*506,700*	*0*	*90,700*	*597,400*	*321,100*	*35.0*
Flagstaff A	1,337,400	743,400	0	99,000	842,400	495,000	37.0
Timber Canyon	1,418,100	777,800	0	231,300	1,009,000	409,000	28.8
Flagstaff A – Burnt River Mountain	1,337,400	743,400	0	99,800	843,200	494,200	37.0
Flagstaff B	1,337,400	743,400	0	100,000	843,400	494,000	36.9
Flagstaff B – Burnt River West	1,337,400	743,400	0	105,500	848,800	488,500	36.5
Flagstaff B - Durkee	1,366,700	756,000	0	127,600	883,700	483,000	35.3

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

There are no identified RFFAs within the geographic area of influence within this segment that would potentially affect visual resources. Therefore there would be no incremental effects on scenic quality in addition to those described in Section 3.2.12. Note, the Baker Valley, Bowen Valley, Caribou Bar, Durkee Creek, Eagle Valley, Lower Powder Valley, Pyles Canyon and Thief Valley, and Sutton Creek VAUs, through past and present actions as well as the B2H Project, could become almost completely visually influenced by development.

Sensitive Viewing Platforms

Table 3-781. Cumulative Effects on Sensitive Viewing Platforms for Segment 3—Baker Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Stationary Sensitive Viewing Platforms				
4-10 City of North Powder				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Timber Canyon	Low	Not applicable	Low	Low
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Flagstaff B	Low	Not applicable	Low	Low
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low
4-17 Grande Tour Oregon Tour Route–Thief Valley Reservoir				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Timber Canyon	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Flagstaff B	Low	Not applicable	Low	Low
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low
4-60 Medical Springs Community				
Timber Canyon	Low	Not applicable	High	High
5-29 Oregon Trail Crossing–Hixon Road				
Applicant's Proposed Action	Moderate	Not applicable	High	High
Variation S3-C1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C2	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C3	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C4	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C5	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C6	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Flagstaff A	Moderate	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	High	High
Flagstaff B	Moderate	Not applicable	High	High
Flagstaff B – Burnt River West	Moderate	Not applicable	High	High
Flagstaff B – Durkee	Moderate	Not applicable	High	High
5-34 Powder River Area of Critical Environmental Concern				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B1	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low

Table 3-781. Cumulative Effects on Sensitive Viewing Platforms for Segment 3—Baker Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
5-36 Powder River Wild and Scenic River Corridor–Thief Valley Reservoir Road				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Timber Canyon	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Flagstaff B	Low	Not applicable	Low	Low
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low
5-74 Daly Creek Road				
Timber Canyon	Low	Not applicable	High	High
5-75 Big Lookout Mountain				
Timber Canyon	Low	Not applicable	High	High
5-79 Eagle Creek Road				
Timber Canyon	Low	Not applicable	High	High
5-81 Burnt River				
Flagstaff B – Burnt River West	Low	Not applicable	High	High
Flagstaff B – Burnt River West	Low	Not applicable	High	High
Flagstaff B – Durkee	Low	Not applicable	Low	Low
Variation S3-C5	*Low*	*Not applicable*	*High*	*High*
Variation S3-C6	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
5-82 Durkee Community				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
Variation S3-C1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C2	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C2	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C3	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C3	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C4	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C4	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C5	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C5	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C6	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C6	*Moderate*	*Not applicable*	*Low*	*Moderate*
Flagstaff A	Moderate	Not applicable	Low	Moderate
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Low	Moderate

Table 3-781. Cumulative Effects on Sensitive Viewing Platforms for Segment 3—Baker Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Flagstaff B	Moderate	Not applicable	Low	Moderate
Flagstaff B – Burnt River West	Moderate	Not applicable	Low	Moderate
Flagstaff B – Durkee	Moderate	Not applicable	Low	Moderate
5-84 BLM Virtue Flat Off-Highway Vehicle Recreation Areas				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S3-B1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-B1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Flagstaff A	Low	Not applicable	Low	Low
Linear Sensitive Viewing Platforms				
Alder Creek				
Applicant's Proposed Action	Low	Not applicable	High	High
Flagstaff A	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	High	High
Daly Creek				
Timber Canyon	Low	Not applicable	High	High
Eagle Creek				
Timber Canyon	Low	Not applicable	High	High
Elkhorn Drive				
Variation S3–B2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B3	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B4	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C1	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Grand Tour Route				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S3-A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-A2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Flagstaff A	Moderate	Not applicable	Low	Moderate
Timber Canyon	Moderate	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Low	Moderate
Flagstaff B	Moderate	Not applicable	Low	Moderate
Flagstaff B – Burnt River West	Moderate	Not applicable	Low	Moderate
Flagstaff B – Durkee	Moderate	Not applicable	Low	Moderate
Flagstaff B – Durkee	Moderate	Not applicable	Low	Moderate
Grand Tour Scenic Bikeway				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3–A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*

Table 3-781. Cumulative Effects on Sensitive Viewing Platforms for Segment 3—Baker Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Variation S3-B1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B3	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B4	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C1	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Timber Canyon	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Flagstaff B	Low	Not applicable	Low	Low
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low
Hells Canyon				
Applicant's Proposed Action	Low	Not applicable	High	High
Variation S3-A1	*Low*	*Not applicable*	*High*	*High*
Variation S3-A2	*Low*	*Not applicable*	*High*	*High*
Variation S3-B1	*Low*	*Not applicable*	*High*	*High*
Variation S3-B2	*Low*	*Not applicable*	*High*	*High*
Variation S3-B3	*Low*	*Not applicable*	*High*	*High*
Variation S3-B4	*Low*	*Not applicable*	*High*	*High*
Variation S3-B5	*Low*	*Not applicable*	*High*	*High*
Variation S3-C1	*Low*	*Not applicable*	*High*	*High*
Flagstaff A	Low	Not applicable	High	High
Timber Canyon	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	High	High
Flagstaff B	Low	Not applicable	High	High
Flagstaff B – Burnt River West	Low	Not applicable	High	High
Flagstaff B – Durkee	Low	Not applicable	High	High
Interstate 84				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S3–A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-A2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-B1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3–B2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3–B3	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-B4	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-B5	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C1	*Moderate*	*Not applicable*	*Low*	*Moderate*

Table 3-781. Cumulative Effects on Sensitive Viewing Platforms for Segment 3—Baker Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Variation S3-C2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C3	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C4	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C5	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S3-C6	*Moderate*	*Not applicable*	*High*	*High*
Flagstaff A	Moderate	Not applicable	Low	Moderate
Timber Canyon	Moderate	Not applicable	Low	Moderate
Flagstaff A – Burnt River Mountain	Moderate	Not applicable	Low	Moderate
Flagstaff B	Moderate	Not applicable	High	High
Flagstaff B – Burnt River West	Moderate	Not applicable	High	High
Flagstaff B – Durkee	Moderate	Not applicable	High	High
Journey Though Time Scenic Byway				
Flagstaff A	Low	Not applicable	Low	Low
Variation S3–B2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B3	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B4	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C1	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Manning Creek Road				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S3-C2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C3	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C4	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C6	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Moderate	Moderate
Timber Canyon	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Powder River Wild and Scenic River/Thief Valley Road				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3–A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Timber Canyon	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Flagstaff B	Low	Not applicable	Low	Low
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low

Table 3-781. Cumulative Effects on Sensitive Viewing Platforms for Segment 3—Baker Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Snake River-Mormon Basin Back-Country Byway				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Variation S3–A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S3–B2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B3	*Low*	*Not applicable*	*High*	*High*
Variation S3-B4	*Low*	*Not applicable*	*High*	*High*
Variation S3-B5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C1	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Variation S3-C3	*Low*	*Not applicable*	*High*	*High*
Variation S3-C4	*Low*	*Not applicable*	*High*	*High*
Variation S3-C5	*Low*	*Not applicable*	*High*	*High*
Variation S3-C6	*Low*	*Not applicable*	*High*	*High*
Flagstaff A	Low	Not applicable	Moderate	Moderate
Timber Canyon	Low	Not applicable	Moderate	Moderate
Flagstaff A – Burnt River Mountain	Low	Not applicable	High	High
Flagstaff B	Low	Not applicable	High	High
Flagstaff B – Burnt River West	Low	Not applicable	High	High
Flagstaff B – Durkee	Low	Not applicable	High	High
Sparta Road				
Timber Canyon	Low	Not applicable	Moderate	Moderate
State Highway 203				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3–A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B3	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B4	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C1	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Timber Canyon	Low	Not applicable	High	High
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Flagstaff B	Low	Not applicable	Low	Low
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low

Table 3-781. Cumulative Effects on Sensitive Viewing Platforms for Segment 3—Baker Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
U.S. Forest Service Road 67-Big Creek				
Timber Canyon	Low	Not applicable	High	High
U.S. Forest Service Road 70				
Timber Canyon	Low	Not applicable	High	High
U.S. Forest Service Road 250				
Timber Canyon	Low	Not applicable	High	High
Special Management Areas				
Powder River Area of Critical Environmental Concern				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S3–A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-A2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3–B3	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B4	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-B5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C1	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C2	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C3	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C4	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C5	*Low*	*Not applicable*	*Low*	*Low*
Variation S3-C6	*Low*	*Not applicable*	*Low*	*Low*
Flagstaff A	Low	Not applicable	Low	Low
Timber Canyon	Low	Not applicable	Low	Low
Flagstaff A – Burnt River Mountain	Low	Not applicable	Low	Low
Flagstaff B	Low	Not applicable	Low	Low
Flagstaff B – Burnt River West	Low	Not applicable	Low	Low
Flagstaff B – Durkee	Low	Not applicable	Low	Low

There are no identified RFFAs within the geographic area of influence within this segment that would potential affect visual resources. Therefore there would be no incremental effects on sensitive viewing platforms in addition to those described in Section 3.2.12.

Segment 4—Brogan

Scenic Quality

Table 3-782. Cumulative Effects Summary for Scenic Quality (in acres) in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	1,718,000	903,500	0	128,800	1,032,300	685,700	39.9
Variation S4-A1	*1,179,000*	*638,500*	*0*	*0*	*638,500*	*540,500*	*45.8*
Variation S4-A2	*1,179,000*	*638,500*	*0*	*0*	*638,500*	*540,500*	*45.8*
Variation S4-A3	*1,179,000*	*638,500*	*0*	*0*	*638,500*	*540,500*	*45.8*
Tub Mountain South	1,608,500	870,300	0	117,900	988,200	620,300	38.6
Willow Creek	1,626,800	882,300	0	87,900	970,200	656,600	40.4

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

There are no identified RFFAs within the geographic area of influence within this segment that would potentially affect visual resources. Therefore there would be no incremental effects on scenic quality in addition to those described in Section 3.2.12. Note, the Alkali Flats, Caribou Bar, Crow Creek, Phillips Creek, Thorn Flat, and Treasure Valley VAUs, through past and present actions as well as the B2H Project, could become almost completely visually influenced by development.

Sensitive Viewing Platforms

Table 3-783. Cumulative Effects on Sensitive Viewing Platforms for Segment 4—Brogan

Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Stationary Sensitive Viewing Platforms				
5-5 Huntington Community				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S4-A1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S4-A2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S4-A3	*Moderate*	*Not applicable*	*Low*	*Moderate*
Tub Mountain South	Moderate	Not applicable	Moderate	Moderate
Willow Creek	Moderate	Not applicable	Low	Moderate

Table 3-783. Cumulative Effects on Sensitive Viewing Platforms for Segment 4—Brogan				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
5-13 Farewell Bend State Recreation Area–Oregon Trail Boulevard				
Tub Mountain South	Moderate	Not applicable	Moderate	Moderate
Willow Creek	Moderate	Not applicable	Low	Moderate
5-59 Spring Wilderness Characteristic Area				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S4-A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S4-A2	*Low*	*Not applicable*	*Low*	*Low*
Variation S4-A3	*Low*	*Not applicable*	*Low*	*Low*
Tub Mountain South	Low	Not applicable	Low	Low
Willow Creek	Low	Not applicable	Low	Low
7-1 Weiser Dunes Bureau of Land Management Campsite				
Tub Mountain South	Low	Not applicable	Low	Low
Willow Creek	Low	Not applicable	Low	Low
7-6 Steck Park Bureau of Land Management Recreation Site				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Willow Creek	Low	Not applicable	Low	Low
8-5 Bully Creek Reservoir				
Tub Mountain South	Low	Not applicable	Moderate	Moderate
8-6 Community of Brogan				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Willow Creek	Low	Not applicable	Low	Low
8-8 Community of Jamieson				
Willow Creek	Low	Not applicable	Moderate	Moderate
8-34 South Alkali Sand Hills Area of Critical Environmental Concern				
Tub Mountain South	Low	Not applicable	Low	Low

There are no identified RFFAs within the geographic area of influence within this segment that would potential affect visual resources. Therefore there would be no incremental effects on sensitive viewing platforms in addition to those described in Section 3.2.12.

Segment 5—Malheur

Scenic Quality

Table 3-784. Cumulative Effects Summary for Scenic Quality in Segment 5—Malheur in Acres							
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	1,058,400	572,900	0	149,900	722,800	335,500	31.7
Variation S5-A1	*562,400*	*335,900*	*0*	*67,200*	*403,100*	*159,300*	*28.3*
Variation S5-A2	*562,400*	*335,900*	*0*	*71,200*	*407,200*	*155,300*	*27.6*
Variation S5-B1	*454,400*	*328,600*	*0*	*19,700*	*348,300*	*106,000*	*23.3*
Variation S5-B2	*454,400*	*328,600*	*0*	*19,700*	*348,300*	*106,000*	*23.3*
Malheur S	1,056,300	534,400	0	169,500	703,900	352,400	33.4
Malheur A	1,056,300	534,400	0	172,100	706,600	349,800	33.1
Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.							

There are no identified RFFAs within the geographic area of influence within this segment that would potentially affect visual resources. Therefore there would be no incremental effects on scenic quality in addition to those described in Section 3.2.12. Note, the Big Sage Flat, North Alkali, Owyhee River, Owyhee Tunnel, Treasure Valley, and Westfall/Harper Valley VAUs, through past and present actions as well as the B2H Project, could become almost completely visually influenced by development.

Sensitive Viewing Platforms

Table 3-785. Cumulative Effects on Sensitive Viewing Platforms for Segment 5—Malheur				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Stationary Sensitive Viewing Platforms				
8-4 Buck Gulch Proposed Wilderness Study Area				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
Malheur S	Moderate	Not applicable	Moderate	Moderate
Malheur A	Moderate	Not applicable	High	High
8-18 Lake Owyhee State Park				
Malheur S	Low	Not applicable	Low	Low
8-21 McIntyre Ridge Proposed Wilderness Study Area				
Malheur A	Low	Not applicable	Low	Low
8-33 Double Mountain Wilderness Characteristic Area – Twin Spring Road North				
Applicant's Proposed Action	Low	Not applicable	High	High
Variation S5-A1	*Low*	*Not applicable*	*High*	*High*
Variation S5-A2	*Low*	*Not applicable*	*High*	*High*

Table 3-785. Cumulative Effects on Sensitive Viewing Platforms for Segment 5—Malheur				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
8-51 Big Bend Launch Site				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Malheur S	Low	Not applicable	Low	Low
Malheur A	Low	Not applicable	Low	Low
8-52 Lower Owyhee Interpretive Site				
Applicant's Proposed Action	Moderate	Not applicable	High	High
Variation S5-B1	*Moderate*	*Not applicable*	*High*	*High*
Variation S5-B2	*Moderate*	*Not applicable*	*Low*	*Moderate*
Malheur S	Moderate	Not applicable	Not applicable	Moderate
Malheur A	Moderate	Not applicable	Not applicable	Moderate
8-74 McIntyre Ridge Wilderness Characteristic Area – Succor Creek Road				
Malheur S	Low	Not applicable	Low	Low
Malheur A	Low	Not applicable	Low	Low
8-84 Burnt Mountain Wilderness Characteristic Area – (Old Mormon hand cart trail)				
Malheur S	Moderate	Not applicable	Low	Moderate
Malheur A	Moderate	Not applicable	High	High
8-85 Sourdough Mountain Wilderness Characteristic Area – Twin Spring Road				
Malheur S	Low	Not applicable	High	High
Malheur A	Low	Not applicable	High	High
8-88 Broken Rim Wilderness Characteristic Area – Hoo Doo Road North				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S5-A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S5-A2	*Low*	*Not applicable*	*Low*	*Low*
Malheur S	Low	Not applicable	High	High
Malheur A	Low	Not applicable	High	High
8-90 Double Mountain Wilderness Characteristic Area – Negro Rock Creek North				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S5-A1	*Low*	*Not applicable*	*Low*	*Low*
Variation S5-A2	*Low*	*Not applicable*	*High*	*High*
Malheur S	Low	Not applicable	Low	Low
Malheur A	Low	Not applicable	Low	Low
8-91 Double Mountain Wilderness Characteristic Area – Twin Spring Road South				
Malheur S	Low	Not applicable	Low	Low
Malheur A	Low	Not applicable	Low	Low
8-93 Double Mountain Wilderness Characteristic Area – Negro Rock Creek Middle				
Malheur S	Low	Not applicable	Low	Low
Malheur A	Low	Not applicable	Low	Low

Table 3-785. Cumulative Effects on Sensitive Viewing Platforms for Segment 5—Malheur				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
8-94 Double Mountain Wilderness Characteristic Area – Negro Rock Creek South				
Malheur S	Low	Not applicable	High	High
Malheur A	Low	Not applicable	High	High
8-95 Owyhee Canyon Recreation Site				
Malheur S	High	Not applicable	Low	High
Malheur S	High	Not applicable	Low	High
Malheur A	High	Not applicable	High	High
8-96 Owyhee River Recreation Site				
Malheur S	High	Not applicable	Moderate	High
Malheur A	High	Not applicable	Moderate	High
8-102 Succor Creek Rural Area				
Applicant's Proposed Action	Low	Not applicable	Moderate	Moderate
Malheur S	Low	Not applicable	Moderate	Moderate
Malheur A	Low	Not applicable	Moderate	Moderate
13-1 Owyhee Wild and Scenic River				
Applicant's Proposed Action	Low	Not applicable	High	High
Variation S5-B1	*Low*	*Not applicable*	*High*	*High*
Variation S5-B2	*Low*	*Not applicable*	*Moderate*	*Moderate*
Linear Sensitive Viewing Platforms				
Mitchell Butte Road				
Applicant's Proposed Action	Low	Not applicable	High	High
S5-B1	*Low*	*Not applicable*	*Low*	*Low*
S5-B2	*Low*	*Not applicable*	*Low*	*Low*
Malheur A	Low	Not applicable	Low	Low
Malheur S	Low	Not applicable	Low	Low
Owyhee River Canyon Entry Road				
Applicant's Proposed Action	Low	Not applicable	High	High
S5-B1	*Low*	*Not applicable*	*High*	*High*
S5-B2	*Low*	*Not applicable*	*High*	*High*
Malheur A	Low	Not applicable	High	High
Malheur S	Low	Not applicable	High	High
U.S. Highway 20				
Applicant's Proposed Action	Low	Not applicable	High	High
S5-A1	*Low*	*Not applicable*	*Low*	*Low*
Malheur A	Low	Not applicable	High	High
Malheur S	Low	Not applicable	High	High

There are no identified RFFAs within the geographic area of influence within this segment that would potential affect visual resources. Therefore there would be no incremental effects on sensitive viewing platforms in addition to those described in Section 3.2.12.

Segment 6—Treasure Valley

Scenic Quality

Table 3-786. Cumulative Effects Summary for Scenic Quality in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Visual Analysis Unit not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
Applicant's Proposed Action	703,500	514,500	0	43,000	557,500	146,000	20.8
Variation S6-A1	*402,800*	*321,900*	*0*	*24,100*	*346,000*	*56,900*	*14.1*
Variation S6-A2	*402,800*	*321,900*	*0*	*20,800*	*342,700*	*60,100*	*14.9*
Variation S6-B1	*366,400*	*264,000*	*0*	*27,500*	*291,600*	*74,800*	*20.4*
Variation S6-B2	*366,400*	*264,000*	*0*	*29,500*	*293,500*	*72,900*	*19.9*

Table Note: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

There are no identified RFFAs within the geographic area of influence within this segment that would potentially affect visual resources. Therefore there would be no incremental effects on scenic quality in addition to those described in Section 3.2.12. Note, the Hidden Valley, Jump Creek, Snake River/Given Hot Springs, Squaw Creek, Treasure Valley, and Willow Spring VAUs, through past and present actions as well as the B2H Project, could become almost completely visually influenced by development.

Sensitive Viewing Platforms

Table 3-787. Cumulative Effects on Sensitive Viewing Platforms for Segment 6—Treasure Valley

Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
Stationary Sensitive Viewing Platforms				
8-75 Antelope Creek Wilderness Characteristic Area				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S6-A1	*Low*	*Not applicable*	*Low*	*Low*
10-12 Snake River Access - Map Rock Road				
Applicant's Proposed Action	Low	Not applicable	Low	Low
Variation S6-B1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S6-B2	*Moderate*	*Not applicable*	*Low*	*Low*

Table 3-787. Cumulative Effects on Sensitive Viewing Platforms for Segment 6—Treasure Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
10-17 Snake River Overlook – Pump Road				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S6-B1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S6-B2	*Moderate*	*Not applicable*	*Low*	*Moderate*
10-19 Map Rock Campground				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S6-B1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S6-B2	*Moderate*	*Not applicable*	*Low*	*Moderate*
12-4 Givens Hot Springs Campground				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S6-B1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S6-B2	*Moderate*	*Not applicable*	*Low*	*Moderate*
12-5 Hemingway Butte Trailhead Off-Highway Vehicle Recreation Site				
Applicant's Proposed Action	High	Not applicable	Low	High
12-8 Jump Creek Canyon Area of Critical Environmental Concern				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
Variation S6-A1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S6-A2	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S6-B1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S6-B2	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
12-13 Residential Area South of Wilson - China Ditch Road				
Applicant's Proposed Action	High	Not applicable	Low	High
Variation S6-B1	*High*	*Not applicable*	*Low*	*High*
Variation S6-B2	*High*	*Not applicable*	*Low*	*High*
12-17 Squaw Creek Canyon				
Applicant's Proposed Action	High	Not applicable	Moderate	High
Variation S6-B1	*High*	*Not applicable*	*Moderate*	*High*
Variation S6-B2	*High*	*Not applicable*	*Low*	*High*
12-18 Squaw Creek Research Natural Area – North				
Applicant's Proposed Action	Moderate	Not applicable	Low	Moderate
Variation S6-B1	*Moderate*	*Not applicable*	*Low*	*Moderate*
Variation S6-B2	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
12-21 Wilson Creek Trailhead				
Applicant's Proposed Action	Moderate	Not applicable	Moderate	Moderate
Variation S6-B1	*Moderate*	*Not applicable*	*Moderate*	*Moderate*
Variation S6-B2	*Moderate*	*Not applicable*	*Moderate*	*Moderate*

Table 3-787. Cumulative Effects on Sensitive Viewing Platforms for Segment 6—Treasure Valley				
Alternative Route	No Action Alternative		Incremental Project Development	Estimated Cumulative Development
	Past and Present Development	Reasonably Foreseeable Future Actions		
12-22 Wilson Creek Wayside				
Applicant's Proposed Action	High	Not applicable	Moderate	High
Variation S6-B1	*High*	*Not applicable*	*Low*	*High*
Variation S6-B2	*High*	*Not applicable*	*Low*	*High*
12-23 Southern Terminus – Wilson Creek Road				
Applicant's Proposed Action	High	Not applicable	Moderate	High
Variation S6-B1	*High*	*Not applicable*	*Low*	*High*
Variation S6-B2	*High*	*Not applicable*	*Low*	*High*
12-27 Residence on Poison Creek Road				
Applicant's Proposed Action	High	Not applicable	Low	High
Variation S6-A1	*High*	*Not applicable*	*Low*	*High*
Variation S6-A2	*High*	*Not applicable*	*Low*	*High*
Variation S6-B1	*High*	*Not applicable*	*Low*	*High*
Variation S6-B2	*High*	*Not applicable*	*Moderate*	*High*
12-28 Residence on Jump Creek Road				
Applicant's Proposed Action	High	Not applicable	Moderate	High
Variation S6-A1	*High*	*Not applicable*	*Moderate*	*High*
Variation S6-A2	*High*	*Not applicable*	*Moderate*	*High*
Variation S6-B1	*High*	*Not applicable*	*Moderate*	*High*
Variation S6-B2	*High*	*Not applicable*	*Moderate*	*High*

There are no identified RFFAs within the geographic area of influence within this segment that would potentially affect visual resources. Therefore there would be no incremental effects on sensitive viewing platforms in addition to those described in Section 3.2.12.

3.3.3.13 Cultural Resources

Issues Identified

Over time, cultural resources are subject to attrition as cultures change and sites weather and erode. In addition, prior development in the region has either degraded or resulted in the loss or discovery of some cultural resources. The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for effects on significant cultural resources throughout the study corridor.

Cumulative effects on cultural resources would occur over the life of the B2H Project and other current and future projects, including direct effects during construction and indirect effects during operation and maintenance activities. Disturbances from future developments and associated ground-disturbing activities could uncover or destroy unrecorded cultural resource sites. Future actions proposed on federal and/or state lands would require cultural resource evaluations and mitigation of affected significant historic properties prior to implementation. The resulting cultural resource documentation

would increase the cultural resources knowledge base for the overall region; however, developments solely on private land are largely exempt from this requirement.

The potential for new rights-of-way and various RFFAs to provide for the eventual collocation of utilities in or near the B2H Transmission Line could further degrade the integrity of setting and increase visual impacts on cultural resources in the indirect effects APE.

EXISTING CONDITIONS

The affected environment describes the baseline conditions for cultural resources (refer to Section 3.2.13.6).

RESULTS

Past and present actions and RFFAs in the study corridor for cultural resources include:

Past and Present Projects

- Aggregate/mineral mining
- Communication facilities
- Communication towers
- Residential and non-residential development
- Recreational development (campgrounds)
- Pipelines
- Developed Disturbed GAP
- Transmission lines and substations
- Dam (irrigation)
- Wind-energy facilities
- Railroads

Reasonably Foreseeable Future Actions

- Wind-energy development

Segment 1—Morrow-Umatilla

Some contribution to cumulative effects on cultural resources from direct adverse effects associated with the construction and operation phase of the B2H Project would be likely in this portion of the study corridor. Cultural resources could be destroyed by construction activities and development of ancillary facilities development. Development of B2H Project components such as access corridors and rights-of-way could increase access to previously inaccessible areas, leading to potential vandalism of cultural resource sites. There also could be cumulative effects from indirect impacts in the form of introduced visual, atmospheric, and audible elements that could detract from the cultural significance of TCPs and historic properties of religious and cultural significance to Indian tribes or other significant cultural resources. These indirect impacts also could adversely affect historic properties or sites that have the potential to be listed in the NRHP. The introduction of additional development could alter the setting and feeling of historic properties and sites of Native American concern (e.g., habitation structures, open

architectural sites, transportation corridors, waterworks, and rock images). Information on resources of Native American concern that may be subject to cumulative effects is provided in Section 3.3.3.14.

As a result of the presence of existing development projects and proposed future actions, cultural resources and potentially significant cultural resources that may be encountered could be adversely affected throughout the B2H Project study corridor. Numerous laws, regulations, and statues, at both the federal and state levels, protect cultural resources (including those cultural resources of Native American concern). These would apply to development within the B2H study corridor (refer to Section 3.2.13 and 3.2.14).

Overall, the addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources in Segment 1, including:

- Numerous pre-contact sites, including lithic scatters, habitation structures, lithic procurement areas, lithic scatters, lithic and tool scatters, cairns, rock alignments, culturally modified trees, and funerary objects (human burial site)
- Numerous historic sites, including cairns, buildings, homesteads, waterworks, and historic transportation corridors
- The NWSTF Boardman and the Umatilla Army Ordinance Depot
- The Oregon NHT (including the NRHP-listed Well Spring Segment), trail-associated sites, and the Oregon NHT/Interpretative Park-California Gulch
- The NRHP-listed Well Spring Segment of the Oregon NHT
- The Lewis and Clark NHT
- Two trails under study for NHT designation (Upper Columbia River Route Study Trail and Umatilla River Route and Columbia River to The Dalles Study Trail)
- Sites and areas of Native American concern (including historic properties of religious and cultural significance to Indian tribes, Sand Hollow Battlefield 1848 [refer to Section 3.3.3.14])
- The McKay Creek area
- Historic resources associated with the communities of Boardman, Echo, and Pilot Rock

There also is the potential for encountering numerous unrecorded, significant sites, including TCPs, along Segment 1. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

The extent of cumulative effects on cultural resources could be reduced significantly through avoidance and implementation of other mitigation measures or treatments identified through the consultation process. Potential impacts on cultural resources in the area would be incremental, and typically, though not in all cases, adverse effects on cultural resources can be mitigated, therefore, the potential to mitigate impacts on cultural resources is good**.** The indirect cumulative effects on cultural resources, as a result of increased public access, would be expected to be low.

It should be noted that portions of the Applicant's Proposed Action Alternative are colocated with an existing transmission line, Variation S1-A1 closely follows the I-84 corridor, and Variation S1-A2 is colocated with an existing transmission line.

Segment 2—Blue Mountains

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources in Segment 2, including:

- Numerous pre-contact sites, including lithic scatters, habitation structures, lithic procurement areas, cairns, and rock alignments
- Numerous historic sites, including cairns, pioneer graves, the Hilgard Cemetery, mining-related sites, and the Mount Emily Lumber Company Railroad
- The NRHP-listed Administrative Building, Eastern Oregon State College (La Grande, Oregon)
- The Oregon NHT and trail-associated sites (including Hilgard Junction and the Clover Creek Station)
- Potential cultural resources in the Ladd Marsh Wildlife Area
- Sites of Native American concern (including one historic property of religious and cultural significance to an Indian tribe [refer to Section 3.3.3.14])
- Historic resources associated with North Powder and La Grande Commercial Historic District, Oregon

There also is the potential for encountering numerous unrecorded, significant sites, including TCPs, along Segment 2. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources associated with Segment 2 would be similar to those effects outlined for Segment 1.

It should be noted that for the majority of its length, the Mill Creek Alternative would closely parallel an existing transmission line. Variations S2-A2 and S2-B2 would closely parallel existing transmission lines for the entirety of their length. Variations S3-A2, S3-B3, S3-C2, and S3-C3 are colocated with existing transmission lines.

Segment 3—Baker Valley

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources in Segment 3, including:

- Numerous pre-contact sites, including lithic scatters, lithic and tool scatters, habitations (rockshelters), lithic procurement areas, cairns, and rock alignments

- Numerous historic sites, including habitations, the Lime-Dixie Cemetery, and mining-related sites
- The Oregon NHT and trail-associated sites (including the Slough House Stage Station)
- The Goodale's Cutoff Study Trail
- Sites or areas of Native American concern (including Hot Medical Springs [refer to Section 3.3.3.14])
- Signature Rock and historic resources associated with North Powder, Weatherby, Durkee, Sparta, the Baker City Historic District, and the Virtue Flat Mining area
- Goal 5 Resources

There also is the potential for encountering numerous unrecorded, significant sites, including TCPs, along Segment 3. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project. Cumulative effects on cultural resources associated with Segment 3 would be similar to those effects outlined for Segment 1.

Segment 4—Brogan

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources in Segment 4, including:

- Numerous pre-contact sites, including lithic scatters, habitations (rockshelters), rock images, human burial sites, cairns, and pre-contact rock alignments
- Numerous historic sites, including habitations, cemeteries (Lime-Dixie, Dell, and Huntington), and the Dalles-Boise Military Road
- The NRHP-listed Oregon Commercial Company Building (Huntington, Oregon)
- The Oregon NHT and trail-associated sites (including a Goal 5 Segment)
- The Olds Ferry Road Study Trail
- Sites or areas of Native American concern (including Striped Mountain and Farewell Bend [refer to Section 3.3.3.14])
- Historic resources associated with the Huntington Survey District and the Vale Irrigation District
- Goal 5 Resources (including Emigrant Graves)

There also is the potential for encountering numerous unrecorded, significant sites, including TCPs, along Segment 4. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project. Cumulative effects on cultural resources associated with Segment 4 would be similar to those effects outlined for Segment 1.

It should be noted that for the majority of their length, Variations S4-A1 through S4-A3 would closely parallel an existing transmission line.

Segment 5—Malheur

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources in Segment 5, including:

- Numerous pre-contact sites, including lithic scatters, habitations (rockshelters), cairns, rock alignments
- Numerous historic sites, including waterworks, habitation structures, and mining-related sites
- The Oregon NHT
- The Meek Cutoff Study Trail
- Sites or areas of Native American concern (including Negro Rock Canyon area [refer to Section 3.3.3.14])
- Historic resources associated with the Owyhee Dam Historic District

There also is the potential for encountering numerous unrecorded, significant sites, including TCPs, along Segment 5. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources associated with Segment 5 would be similar to those effects outlined for Segment 1.

It should be noted that portions of the Malheur S Alternative, the Malheur A Alternative, Variation S5-A2, Variation S5-B1, and Variation S5-B2 would fall in designated utility corridors.

Segment 6—Treasure Valley

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources in Segment 6, including:

- Numerous pre-contact sites, including lithic scatters, human burial sites, habitations (rockshelters), the Alkali Springs Site (Paleoindian village), cairns, and rock alignments
- Numerous historic sites, including waterworks, the Wilson Cemetery, and the WWIII Marsing Bomb Range
- The NRHP-listed Bernard's Ferry and Poison Creek Stage Station
- Graveyard Point
- The Southern Alternate Route of the Oregon NHT
- Sites or areas of Native American concern (including Graveyard Point [refer to Section 3.3.3.14])
- Resources associated with the NRHP-listed Map Rock Petroglyphs Historic District and the Givens Hot Springs area

There also is the potential for encountering numerous unrecorded, significant sites, including TCPs, along Segment 6. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources associated with Segment 6 would be similar to those effects outlined for Segment 1.

It should be noted that for the entirety of its length, the Applicant's Proposed Action Alternative would parallel an existing transmission line. The route's southern half also would fall in designated utility corridor. Variation S6-A2, S6-B1, and S6-B2 would fall in designated utility corridors. Additionally, these route variations closely parallel an existing transmission line. Variation S6-A1 would parallel an existing transmission line and designated utility corridors.

3.3.3.14 Native American Concerns

Issues Identified

As stated in Section 3.3.3.13, cultural resources are subject to attrition as cultures change and sites weather and erode. In addition, prior development in the region has either degraded or resulted in the loss or discovery of some cultural resources. The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for effects on Native American concerns, including historic properties of religious and cultural significance to Indian tribes, throughout the B2H Project study corridor.

Cumulative effects on sites of Native American concern, including historic properties of religious and cultural significance to Indian tribes, would occur over the life of the B2H Project and other current and future projects, including direct effects during construction and indirect effects during operation and maintenance activities. Disturbances from future developments and associated ground-disturbing activities could uncover or destroy unrecorded sites of potential tribal significance, including historic properties of religious and cultural significance to Indian tribes. Future actions proposed on federal and/or state lands would require consultation with affected Native American sovereign tribal governments, evaluation of cultural resources, and mitigation of affected significant resources prior to B2H Project implementation. Developments solely on private land are exempt from this requirement.

The potential for new rights-of-way and various RFFAs to provide for the eventual collocation of utilities in or near the B2H Transmission Line could further degrade the integrity of setting and increase visual impacts on resources of Native American concern in the indirect effects APE.

Of note, Native American tribes have expressed that areas in which EMF is present would be rendered unsuitable for cultural and religious practices. Potential impacts of EMF would be discussed in government-to-government consultation between the BLM and the appropriate Native American sovereign tribal governments, on a case-by-case basis. The potential impacts of EMF from the B2H Project are described in Section 3.2.18 (Public Health and Safety).

EXISTING CONDITIONS

The affected environment describes the baseline conditions for cultural resources (refer to Section 3.2.13.6).

RESULTS

Past and present actions and RFFAs in the study corridor for Native American concerns and sites of potential tribal significance include:

Past and Present Projects

- Aggregate/mineral mining
- Communication facilities
- Communication towers
- Residential and non-residential development
- Recreational development (campgrounds)
- Pipelines
- Developed Disturbed GAP
- Transmission lines and substations
- Dam (irrigation)
- Wind-energy facilities
- Railroads

Reasonably Foreseeable Future Actions

- Wind-energy development

Segment 1—Morrow-Umatilla

Cumulative effects from direct adverse effects associated with the construction and operation phase of the B2H Project are likely in this portion of the study corridor. Cultural resources of cultural, traditional, or religious importance to Native American tribes could be destroyed by construction activities and development of ancillary facilities. Development of new access corridors and rights-of-way could increase access to previously inaccessible areas, leading to potential vandalism of these resources. There also could be cumulative effects from indirect impacts in the form of introduced visual, atmospheric, and audible elements that could detract from the cultural significance of potential historic properties of religious and cultural significance to Indian tribes or other significant cultural resources that may be of interest to the tribes. These indirect impacts also could adversely affect historic properties or sites that have the potential to be listed in the NRHP. The introduction of additional development could alter the setting and feeling of historic properties.

As a result of the presence of existing development projects and proposed future actions, cultural resources of Native American concern and potentially significant cultural resources that may be encountered could be affected negatively throughout the B2H Project study corridor. Numerous laws, regulations, and statues, at both the federal and state levels, protect cultural resources of Native

American concern. These would apply to development within the B2H study corridor (refer to Section 3.2.14).

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on Native American concerns or other cultural resources in Segment 1 that may be of interest to the tribes. Some of these resources are:

- Pre-contact habitation structures, cairns, rock alignments, culturally modified trees, “Indian Trails,” and funerary objects (human burial site)
- The Oregon NHT (path of the Forced March of 1879)
- Historic properties of religious and cultural significance to Indian tribes in the NWSTF Boardman
- Sand Hollow Battlefield 1848
- Areas of Native American concern (McKay Creek, Birch Creek, and Butter Creek)
- Sites of tribal significance near Pilot Rock
- Traditional foods

There also is the potential for encountering numerous unrecorded, significant sites along Segment 1. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

The extent of cumulative effects on cultural resources of Native American concern (including historic properties of religious and cultural significance to Indian tribes) could be reduced significantly through avoidance and implementation of agency-required mitigation measures. Potential impacts on cultural resources in the area would be incremental, and typically, though not in all cases, adverse effects on cultural resources can be mitigated, therefore, and the potential to mitigate impacts on cultural resources is good. The indirect cumulative effects on these sites, as a result of increased public access, would be expected to be low.

It should be noted that portions of the Applicant’s Proposed Action Alternative are colocated with an existing transmission line, Variation S1-A1 closely follows the I-84 corridor, and Variation S1-A2 is colocated with an existing transmission line.

Segment 2—Blue Mountains

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on Native American concerns or other cultural resources in Segment 2 that may be of interest to the tribes. Some of these resources are:

- Pre-contact habitation structures, cairns, and rock alignments
- The Oregon NHT (path of the Forced March of 1879)
- Potential cultural resources of tribal significance in the Glass Hill area

- Historic properties of religious and cultural significance to and Indian tribe (traditional fishery/campsite)
- Traditional foods

There also is the potential for encountering numerous unrecorded, significant sites along Segment 2. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources of Native American concern associated with Segment 2 would be similar to those effects outlined for Segment 1.

It should be noted that for the majority of its length, the Mill Creek Alternative would closely parallel an existing transmission line. Variations S2-A2 and S2-B2 would closely parallel existing transmission lines for the entirety of their length. Variations S3-A2, S3-B3, S3-C2, and S3-C3 are colocated with existing transmission lines.

Segment 3—Baker Valley

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on Native American concerns or other cultural resources in Segment 3 that may be of interest to the tribes. Some of these resources are:

- Pre-contact habitations (rockshelters), cairns, and rock alignments
- The Oregon NHT (path of the Forced March of 1879)
- Medical Hot Springs and its surroundings
- Known rock features (primarily cairns) near Durkee and Burnt River Canyon
- Traditional foods

There also is the potential for encountering numerous unrecorded, significant sites along Segment 3. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources of Native American concern associated with Segment 3 would be similar to those effects outlined for Segment 1.

Segment 4—Brogan

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on Native American concerns or other cultural resources in Segment 4 that may be of interest to the tribes. Some of these resources are:

- Pre-contact habitation (rockshelter), rock images, human burial sites, cairns, and rock alignments
- The Oregon NHT (path of the Forced March of 1879)

- Areas of Native American concern (Striped Mountain and Farewell Bend)
- Cultural landscape (extends from the Farewell Bend area to the south, just east of the Tub Mountain South Alternative)
- Traditional foods

There also is the potential for encountering numerous unrecorded, significant sites along Segment 4. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources of Native American concern associated with Segment 4 would be similar to those effects outlined for Segment 1.

It should be noted that for the majority of their length, Variations S4-A1 through S4-A3 would closely parallel an existing transmission line.

Segment 5—Malheur

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on Native American concerns or other cultural resources in Segment 5 that may be of interest to the tribes. Some of these resources are:

- Pre-contact habitations (rockshelters), cairns, and rock alignments
- The Oregon NHT (path of the Forced March of 1879)
- Areas of Native American concern (Negro Rock Canyon area and Malheur Butte)
- Traditional foods

There also is the potential for encountering numerous unrecorded, significant sites along Segment 5. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources of Native American concern associated with Segment 5 would be similar to those effects outlined for Segment 1.

It should be noted that portions of the Malheur S Alternative, the Malheur A Alternative, Variation S5-A2, Variation S5-B1, and Variation S5-B2 would fall in designated utility corridors.

Segment 6—Treasure Valley

The addition of the B2H Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on Native American concerns or other cultural resources in Segment 6 that may be of interest to the tribes. Some of these resources are:

- Pre-contact human burial sites, habitations (rockshelters and village), cairns, rock alignments
- The Southern Alternate Route of the Oregon NHT (path of the Forced March of 1879)

- Graveyard Point
- Potential for undocumented pre-contact rock images and pithouses in the Givens Hot Springs area
- Traditional foods

There also is the potential for encountering numerous unrecorded, significant sites along Segment 6. The assessment of cumulative effects on sites discovered later would be a part of ongoing cultural resources efforts in compliance with Section 106 of the NHPA and per the requirements of the Programmatic Agreement for the B2H Project.

Cumulative effects on cultural resources of Native American concern associated with Segment 6 would be similar to those effects outlined for Segment 1.

It should be noted that for the entirety of its length, the Applicant's Proposed Action Alternative would parallel an existing transmission line. The route's southern half also would fall in designated utility corridor. Variation S6-A2, S6-B1, and S6-B2 would fall in designated utility corridors. Additionally, these route variations closely parallel an existing transmission line. Variation S6-A1 would parallel an existing transmission line and designated utility corridors.

3.3.3.15 National Historic Trails and Trails Under Study for Congressional Designation

This section estimates cumulative effects on NHTs and Study Trails considering the B2H Project effects (described in Section 3.2.15) in addition to past and present actions and other RFFAs listed in Table 3-639and Table 3-640. Cumulative effects on National Historic Trails would result from the incremental effect on trail-associated resources as well as future management of the trail through development of past and present and RFFAs.

The approach for analysis of cumulative effects on NHTs and Study Trails, including the geographic and temporal scopes of analysis, is presented in Table 3-638 at a high level with more detail in the following discussion. The geographic scope for analyzing cumulative effects on NHTs is two tiered to first assess impacts on broader-scale trail management components (e.g., congressionally designated trail alignment) and then on NPS-specific management components (e.g., high potential route segments, high potential historic sites, and auto tour route). To be consistent with the assessment of B2H Project impacts, the area within 5 miles of these trail-associated management components was defined as the area of potential cumulative effects. Since the congressionally designated trail alignment and auto tour route extend beyond the B2H Project area, those components were clipped to the area within 5 miles of any route within a specific B2H Project segment to focus the discussion on areas where the introduction of the B2H Project would lead to cumulative impacts on NHTs and Study Trails. In regard to high potential route segments and high potential historic sites, the entire area within 5 miles of each of these segments and sites was considered to be the area of potential cumulative effects and these areas were not clipped even if they extended beyond the B2H Project area. The assessment of cumulative effects on Study Trails focused on the feasibility study alignments and considered the area within 5 miles of feasibility study alignment and any route within a specific B2H Project segment. The

temporal scope for analysis of cumulative effects on NHTs and Study Trails was defined by the duration of the agency right-of-way grant for the B2H Project (50 years), but it is important to note that potential future right-of-way extensions may extend the life of the B2H Project beyond 50 years.

Issues Identified for Analysis

Cumulative effects on a NHT or Study Trail could result from the development of past and present actions and RFFAs through the modification of the trail's resources, qualities, values, and associated settings, or primary use(s), including:

- Interfering with, or being incompatible, with the intended experience of the trail as expressed in the trail's nature and purpose
- Modifying the characteristics and setting associated with high potential route segments or high potential historic sites
- Cumulative effects would compromise vicarious recreation opportunities along the NPS Auto Tour Route

Existing Condition

Oregon National Historic Trail

Development occurs adjacent to the Oregon NHT along most of its alignment from Boardman in the north to Givens Hot Springs in Idaho, consisting primarily of existing utility development, agricultural and community development, and highways and other roads paralleling the trail's alignment. Some areas have been minimally affected by development, such as the Well Spring High Potential Historic Site in Segment 1 or along the Alkali Springs High Potential Historic Route Segment in Segment 4, which both have a highly intact trail setting. Refer to Section 3.2.15 for additional information on the existing condition along the Oregon NHT.

Lewis and Clark National Historic Trail

The setting adjacent to the Lewis and Clark NHT in Segment 1, and the NPS Auto Tour Route, has been modified by existing transmission lines, agricultural and community development, a railroad grade, and highways and other roads near the community of Boardman. Additionally the Columbia River, both the outbound and return route for the Lewis and Clark Expedition, has been dammed resulting in much wider river than during the trail's period of significance. Refer to Section 3.2.15 for additional information on the existing condition along the Lewis and Clark NHT.

Goodale's Cutoff Study Trail

The B2H Project is located in proximity to the Goodale's Cutoff Study Trail in two different areas in Segment 3. The first area is east of Flagstaff Hill, near Baker City, where there is limited development in Virtue Flat except for paved and two-track roads, the NHOTIC, the Virtue Flat ATV area, and a shooting range. The second area is in Eagle Valley which has been modified by agricultural and community development, but the areas along Eagle Creek and Powder River have a more intact trail

setting. Refer to Section 3.2.15 for additional information on the existing condition along the Goodale's Cutoff Study Trail.

Meek Cutoff Study Trail

The two alignments under study by the NPS, Hambleton and Ragen routes, generally follow the same alignment between the communities of Vale and Harper. The setting adjacent to these communities has been modified by agricultural development but in Malheur Canyon and south on Vines Hill, the trail's setting is more intact limited to existing gravel and two-track roads and in Malheur Canyon, an abandoned rail line and canal. Refer to Section 3.2.15 for additional information on the existing condition along the Meek Cutoff Study Trail.

Upper Columbia River Route Study Trail

The setting adjacent to the Upper Columbia River Route Study Trail, similar to the Lewis and Clark NHT, has been modified by existing transmission lines, agricultural and community development, a railroad grade, and highways and other roads near the community of Boardman. Refer to Section 3.2.15 for additional information on the existing condition along the Upper Columbia River Route Study Trail.

Olds Ferry Road Study Trail

Near Farewell Bend, south of the community of Huntington, the setting adjacent to the Olds Ferry Road Study Trail has been modified by an existing 138-kV transmission line, I-84, and recreation and commercial development adjacent to Farewell Bend. Refer to Section 3.2.15 for additional information on the existing condition along the Olds Ferry Road Study Trail.

Umatilla River Route and Columbia River to the Dalles Study Trail

The B2H Project is located adjacent to the Umatilla River Route and Columbia River to The Dalles Study Trail in two areas. The first area is between the communities of Echo and Umatilla, where the Study Trail roughly parallels the modern day U.S. Highway 395. This area has been modified by agricultural and community development, an existing 230-kV transmission line, and I-84. The other area, along the Columbia River, has been modified by existing transmission lines, agricultural and community development, a railroad grade, and highways and other roads near the community of Boardman. Refer to Section 3.2.15 for additional information on the existing condition along the Umatilla River Route and Columbia River to The Dalles Study Trail.

RESULTS BY SEGMENT

Cumulative effects on each NHT, or Study Trail, were assessed using quantitative analysis supported by written descriptions to give these GIS generated numbers context. As described previously, the assessment of cumulative effects on NHTs and Study Trails includes both broad-scale trail management and NPS-specific management components which are quantified in tables in the following section for each component (e.g., Oregon NHT – Boardman High Potential Historic Route Segment).

These tables include the following six columns describing the (1) total available resource, (2) past and present development, (3) RFFAs, (4) incremental project development, (5) estimated cumulative development, and (6) remaining available resource. The total available resource, by trail management component, is the acreage within 5 miles of each trail management component establishing the setting potentially affected by the B2H Project and past and present actions and other RFFAs. The acres occupied by past and present development and RFFAs are the next two columns in the cumulative effect tables, establishing the areas potentially modified even if the B2H Project No Action Alternative was selected. Incremental project development introduces the acres to be occupied by different B2H Project alternatives and route variations within the setting associated with each trail management component. The last two columns in the cumulative effect tables provide the total area occupied by the B2H Project and past and present actions and other RFFAs and the extent of the trail management component setting not directly affected by development. Note that these calculations are associated with direct impacts on the lands within the trail management component settings (i.e., 5-mile buffer) and do not include the indirect influence on trail setting associated with past, present, and RFFAs. For example, a wind farm may occupy 100 acres but its influence on trail setting may extend for several miles beyond its physical footprint due to the height of the wind turbines Narrative descriptions of the cumulative effects, by Project segment, are described in the subsequent sections, including indirect effects on trail setting.

Oregon National Historic Trail

Segment 1—Morrow-Umatilla

Cumulative effects on the Oregon NHT in this segment were assessed from the:

- Congressionally designated trail alignment (Table 3-788)
- High potential historic sites
  - Well Spring (Table 3-789)
  - Echo Meadows (Table 3-790)
  - Echo Complex (Table 3-791)
  - Emigrant Springs (Table 3-792)
  - Meacham (Table 3-793)
  - Blue Mountain Crossing Interpretive Park(Table 3-794)
- High potential historic route segments
  - Boardman (Table 3-795)
  - Blue Mountains (Table 3-796)
- NPS Auto Tour Route (Table 3-797)

Congressionally Designated Trail Alignment

The setting adjacent to the Oregon NHT in Segment 1 has been modified by widespread agricultural and community development west of the Blue Mountains. In addition to this development, existing transmission lines, pipelines, I-84, paved and gravel roads, small mining operations, and wind turbines have locally modified the setting of the Oregon NHT. The addition of the B2H Project would further

modify the trail's setting and due to the scale of the proposed transmission line towers, would influence the setting beyond the B2H Project's footprint leading to additive cumulative effects where the setting has already been modified by existing development. The alternatives using the West of Bombing Range Road alignment would have a reduced incremental project influence on cumulative effects since the proposed right-of-way would replace an existing transmission line leading to a decrease in the area viewed as modified compared to routes using the East of Bombing Range Road or I-84 alignments. Variation S1-A1 would have decreased cumulative effects, compared to Variation S1-A2, as this variation traverses agricultural fields already viewed as modified whereas Variation S1-A2 crosses mostly natural lands in proximity to the Oregon NHT. Through the future development of the Wheatridge and Buttercreek wind farms, in context with existing development and the B2H Project, the setting adjacent to the Oregon NHT south of the community of Boardman would become dominated by energy development.

In the Blue Mountains, the setting adjacent to the Oregon NHT has been modified by I-84, an existing 230-kV transmission line, small mining operations, and paved and gravel roads which due to the steep forested terrain in the Blue Mountains, are intermittently visible from the Oregon NHT. The introduction of the B2H Project would intensive cumulative effects adjacent to I-84 and the existing 230-kV transmission line as these modifications would be consolidated along a corridor within the Oregon NHT's setting. No RFFAs are located adjacent to the Oregon NHT in the Blue Mountains.

Table 3-788. Cumulative Effects Summary for the Oregon National Historic Trail Congressionally Designated Alignment in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	494,974	18,905	455	647	20,007	474,967
Variation S1-B1	*494,974*	*18,905*	*455*	*141*	*19,501*	*475,473*
Variation S1-B2	*494,974*	*18,905*	*455*	*130*	*19,490*	*475,484*
East of Bombing Range Road	494,974	18,905	455	740	20,100	474,874
Applicant's Proposed Action – Southern Route	494,974	18,905	455	657	20,017	474,957
West of Bombing Range Road – Southern Route	494,974	18,905	455	475	19,836	475,139
Longhorn	494,974	18,905	455	622	19,983	474,991
Interstate 84	494,974	18,905	455	763	20,124	474,850
Variation S1-A1	*494,974*	*18,905*	*455*	*209*	*19,569*	*475,405*
Variation S1-A2	*494,974*	*18,905*	*455*	*405*	*19,765*	*475,209*
Interstate 84 – Southern Route	494,974	18,905	455	772	20,132	474,842

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Well Spring High Potential Historic Site

The area adjacent to the Well Spring High Potential Historic Site has been modified by paved and gravel roads, small mining operations, and agricultural uses to the east and south of the site. The introduction of the B2H Project along Bombing Range Road would lead to increased cumulative effects to the east of the Well Spring High Potential Historic Site due to the height of the proposed transmission line structures, which would further influence the Oregon NHT setting expanding the area viewed as modified. Through the future development of the Wheatridge Wind Farm in context with existing development and the B2H Project, the setting to the east of the site would become dominated by energy development.

Table 3-789. Cumulative Effects Summary for the Oregon National Historic Trails Well Spring High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	50,265	746	70	66	881	49,384
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	50,265	746	70	97	913	49,352
Applicant's Proposed Action – Southern Route	50,265	746	70	67	882	49,383
West of Bombing Range Road – Southern Route	50,265	746	70	93	909	49,356
Longhorn	50,265	746	70	0	816	49,449
Interstate 84	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Echo Meadows High Potential Historic Site

The setting of the Echo Meadows High Potential Historic Site has been modified by agricultural uses surrounding this site as well as views of existing transmission lines, pipelines, I-84, and the existing Oregon Wind Farm to the west. The introduction of the B2H Project along I-84 would increase the area viewed as modified, where visible, approximately 4 miles north of the site. Through the future development of the Wheatridge Wind Farm in context with existing development and the B2H Project, the site's setting would become further developed and dominated by modern uses.

Table 3-790. Cumulative Effects Summary for the Oregon National Historic Trail Echo Meadows High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Applicant's Proposed Action – Southern Route	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Longhorn	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Interstate 84	50,265	1,805	29	60	1,893	48,371
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	50,265	1,805	29	61	1,894	48,371

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Echo Complex High Potential Historic Site

The area adjacent to the Echo Complex High Potential Historic Site has been modified by agricultural and community development near Echo as well as I-84, an existing 230-kV transmission line, and other paved and gravel roads. The B2H Project, along I-84, would intensify cumulative effects to the north where the B2H Project would be visible 1.5 miles away and, if Variation S1-A2 was selected, to the east of the site where the B2H Project would parallel the existing 230-kV transmission line approximately 1 mile away. No RFFAs are located adjacent to the Echo Complex High Potential Historic Site.

Table 3-791. Cumulative Effects Summary for the Oregon National Historic Trail Echo Complex High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Table 3-791. Cumulative Effects Summary for the Oregon National Historic Trail Echo Complex High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action – Southern Route	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
West of Bombing Range Road – Southern Route	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Longhorn	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Interstate 84	50,265	2,699	0	91	2,790	47,475
Variation S1-A1	*50,265*	*2,699*	*0*	*36*	*2,735*	*47,530*
Variation S1-A2	*50,265*	*2,699*	*0*	*132*	*2,831*	*47,434*
Interstate 84 – Southern Route	50,265	2,699	0	92	2,791	47,474

Table Nots: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Emigrant Springs High Potential Historic Site

The setting adjacent to the Emigrant Springs High Potential Historic Site has been modified by I-84, an existing 230-kV transmission line, pipeline, small mining operations, and paved and gravel roads. Due to the steep forested terrain adjacent to this site, these modifications would be intermittently screened from view by topography and vegetation. The addition of the B2H Project, approximately 4 miles away, would minimally increase cumulative effects to the south of this site, as the steep forested terrain would mostly screen views these views. No RFFAs are located adjacent to the Emigrant Springs High Potential Historic Site.

Table 3-792. Cumulative Effects Summary for the Oregon National Historic Trail Emigrant Springs High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	50,265	2,264	0	98	2,361	47,903
Variation S1-B1	*50,265*	*2,264*	*0*	*0*	*2,264*	*48,001*
Variation S1-B2	*50,265*	*2,264*	*0*	*0*	*2,264*	*48,001*
East of Bombing Range Road	50,265	2,264	0	98	2,361	47,903
Applicant's Proposed Action – Southern Route	50,265	2,264	0	99	2,363	47,902
West of Bombing Range Road – Southern Route	50,265	2,264	0	104	2,368	47,897
Longhorn	50,265	2,264	0	100	2,363	47,901

Table 3-792. Cumulative Effects Summary for the Oregon National Historic Trail Emigrant Springs High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Interstate 84	50,265	2,264	0	99	2,363	47,902
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	50,265	2,264	0	100	2,364	47,901
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Meacham High Potential Historic Site

Similar to Emigrant Springs, the setting adjacent to the Meacham High Potential Historic Site has been modified by I-84, an existing 230-kV transmission line, pipeline, small mining operations, and paved and gravel roads. Due to the steep forested terrain adjacent to this site, these modifications would be intermittently screened from view by topography and vegetation. The addition of the B2H Project, 2.75 miles away, would minimally increase cumulative effects to the south of this site as the steep forested terrain would mostly screen views these views. No RFFAs are located adjacent to the Meacham High Potential Historic Site.

Table 3-793. Cumulative Effects Summary for the Oregon National Historic Trail Meacham High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	50,265	1,702	0	145	1,847	48,418
Variation S1-B1	*50,265*	*1,702*	*0*	*0*	*1,702*	*48,563*
Variation S1-B2	*50,265*	*1,702*	*0*	*0*	*1,702*	*48,563*
East of Bombing Range Road	50,265	1,702	0	145	1,847	48,418
Applicant's Proposed Action – Southern Route	50,265	1,702	0	148	1,850	48,415
West of Bombing Range Road – Southern Route	50,265	1,702	0	155	1,857	48,408
Longhorn	50,265	1,702	0	148	1,850	48,415

Table 3-793. Cumulative Effects Summary for the Oregon National Historic Trail Meacham High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Interstate 84	50,265	1,702	0	148	1,849	48,415
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	50,265	1,702	0	149	1,851	48,414
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Blue Mountain Crossing Interpretive Park High Potential Historic Site

The lands adjacent to the Blue Mountain Crossing Interpretive Park High Potential Historic Site have been modified by I-84, an existing 230-kV transmission line, pipeline, small mining operations, and paved and gravel roads. The tall, dense vegetation adjacent to this site intermittently screens views of these modifications, as well as the steep terrain, reducing their influence on the site's setting. The addition of the B2H Project would intensify cumulative effects, especially Variation S1-B2 located 0.5 mile away which would dominate views to the southwest where visible. No RFFAs are located adjacent to the Blue Mountain Crossing Interpretive Park High Potential Historic Site.

Table 3-794. Cumulative Effects Summary for the Oregon National Historic Trail Blue Mountain Crossing Interpretive Park High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	47,604	1,144	0	152	1,296	46,309
Variation S1-B1	*47,604*	*1,144*	*0*	*141*	*1,284*	*46,320*
Variation S1-B2	*49,084*	*1,158*	*0*	*130*	*1,288*	*47,797*
East of Bombing Range Road	47,604	1,144	0	152	1,295	46,309
Applicant's Proposed Action – Southern Route	47,604	1,144	0	155	1,298	46,306
West of Bombing Range Road – Southern Route	47,604	1,144	0	162	1,305	46,299
Longhorn	47,604	1,144	0	155	1,299	46,305

Table 3-794. Cumulative Effects Summary for the Oregon National Historic Trail Blue Mountain Crossing Interpretive Park High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Interstate 84	47,604	1,144	0	154	1,298	46,306
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	47,604	1,144	0	156	1,300	46,305
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Boardman High Potential Historic Route Segment

Other than a few small mining operations and gravel roads, the existing setting adjacent to the Boardman High Potential Historic Route Segment is highly intact west of Bombing Range Road. Further to the east, existing development has modified the trail segment's setting through widespread agricultural uses and existing transmission lines in proximity to the trail segment. The alternatives using the West of Bombing Range Road alignment would have a reduced incremental project influence on cumulative effects since the proposed right-of-way would replace an existing transmission line leading to a decrease in the area viewed as modified compared to routes using the East of Bombing Range Road alignment. The B2H Project would have limited incremental effects on cumulative effects along the Longhorn and I-84 alternatives as they are not located in proximity to this trail segment. Through the future development of the Wheatridge and Buttercreek wind farms, in context with existing development and the B2H Project, the setting to the south of the Boardman High Potential Historic Route Segment would become dominated by energy development.

Table 3-795. Cumulative Effects Summary for the Oregon National Historic Trail Boardman High Potential Historic Route Segment in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	86,412	1,548	103	159	1,811	84,602
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	86,412	1,548	103	253	1,905	84,508
Applicant's Proposed Action – Southern Route	86,412	1,548	103	162	1,813	84,599

Table 3-795. Cumulative Effects Summary for the Oregon National Historic Trail Boardman High Potential Historic Route Segment in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
West of Bombing Range Road – Southern Route	86,412	1,548	103	106	1,757	84,655
Longhorn	86,412	1,548	103	9	1,661	84,751
Interstate 84	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Blue Mountains High Potential Historic Route Segment

The setting adjacent to the Blue Mountains High Potential Historic Route Segment has been modified by I-84, an existing 230-kV transmission line, pipeline, small mining operations, paved and gravel roads, and near La Grande, community and agricultural development. Due to the steep forested terrain adjacent to this trail segment, these modifications would be intermittently screened from view by topography and vegetation. The addition of the B2H Project would intensify cumulative effects, especially Variation S1-B2 located 0.5 mile away which would dominate views to the southwest where visible. No RFFAs are located adjacent to the Blue Mountains High Potential Historic Route Segment.

Table 3-796. Cumulative Effects Summary for the Oregon National Historic Trail Blue Mountains High Potential Historic Route Segment in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	150,777	7,010	0	232	7,241	143,536
Variation S1-B1	*150,777*	*7,010*	*0*	*141*	*7,151*	*143,627*
Variation S1-B2	*150,777*	*7,010*	*0*	*130*	*7,139*	*143,638*
East of Bombing Range Road	150,777	7,010	0	231	7,241	143,536
Applicant's Proposed Action – Southern Route	150,777	7,010	0	235	7,245	143,532
West of Bombing Range Road – Southern Route	150,777	7,010	0	246	7,256	143,521
Longhorn	150,777	7,010	0	236	7,246	143,531

Table 3-796. Cumulative Effects Summary for the Oregon National Historic Trail Blue Mountains High Potential Historic Route Segment in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Interstate 84	150,777	7,010	0	235	7,245	143,532
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	150,777	7,010	0	238	7,247	143,530

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

National Park Service Auto Tour Route

The portion of the NPS Auto Tour Route (I-84) near Boardman has been modified by extensive agricultural operations as well as multiple existing transmission lines, a railroad alignment, and industrial development east of the community of Boardman. The addition of any B2H Project alternative in this area would intensify these effects but would occur in an area already viewed as modified from the NPS Auto Tour Route. Continuing to the east, the B2H Project alternatives paralleling I-84 would continue to intensify cumulative effects in areas increasingly less dominated by existing modifications except for agricultural development to the north and south of the NPS Auto Tour Route. The future development of the Buttercreek Wind Farm would incrementally increase cumulative effects on views to the south but the primary cumulative effect east of Boardman would be the B2H Project paralleling the NPS Auto Tour Route through agriculturally developed lands. In the Blue Mountains, views from the NPS Auto Tour Route have been modified by an existing 230-kV transmission line, pipeline, small mining operations, and paved and gravel roads. Due to the steep forested terrain adjacent to this trail segment, these modifications would be intermittently screened from view by topography and vegetation. The addition of the B2H Project would intensify cumulative effects, especially Variation S1-B2 which crosses the NPS Auto Tour Route twice and parallel the route for 3 miles adjacent to the existing 230-kV transmission line dominating views in this area. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

Table 3-797. Cumulative Effects Summary for the Oregon National Historic Trail National Park Service Auto Tour Route in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	472,174	29,664	17	347	30,027	442,147
Variation S1-B1	*472,174*	*29,664*	*17*	*141*	*29,821*	*442,353*
Variation S1-B2	*472,174*	*29,664*	*17*	*130*	*29,810*	*442,364*
East of Bombing Range Road	472,174	29,664	17	450	30,130	442,044
Applicant's Proposed Action – Southern Route	472,174	29,664	17	352	30,033	442,141
West of Bombing Range Road – Southern Route	472,174	29,664	17	369	30,050	442,125
Longhorn	472,174	29,664	17	556	30,236	441,938
Interstate 84	472,174	29,664	17	921	30,602	441,572
Variation S1-A1	*472,174*	*29,664*	*17*	*209*	*29,890*	*442,284*
Variation S1-A2	*472,174*	*29,664*	*17*	*405*	*30,085*	*442,089*
Interstate 84 – Southern Route	472,174	29,664	17	932	30,612	441,562

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Segment 2—Blue Mountains

Cumulative effects on the Oregon NHT in this segment were assessed from the:

- Congressionally designated trail alignment (Table 3-798)
- High potential historic site
  - Hilgard Junction (Table 3-799)
- High potential historic route segments
  - Blue Mountains (Table 3-800)
  - Ladd Canyon (Table 3-801)
- NPS Auto Tour Route (Table 3-802)

Congressionally Designated Trail Alignment

The setting adjacent to the Oregon NHT in Segment 2 has been modified by agricultural and community development in Grande Ronde and North Powder valleys, I-84, existing 230-kV transmission line, paved and gravel roads, small mining operations, and wind turbines on Telocaset Hill northeast of the community of North Powder. The addition of the B2H Project would further modify the trail's setting and due to the scale of the proposed transmission line towers, would influence the setting beyond the B2H Project's footprint leading to additive cumulative effects where the setting has already been modified by development. The Glass Hill and Applicant's Proposed Alternative would have reduced additive cumulative effects on the Oregon NHT, compared to the Mill Creek Alternative, which

parallels the Oregon NHT west and south of La Grande, including in Ladd Canyon. No RFFAs are located adjacent to the Oregon NHT in this segment.

Table 3-798. Cumulative Effects Summary for the Oregon National Historic Trail Congressionally Designated Alignment in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	213,236	9,546	0	750	10,296	202,940
Variation S2-A1	*213,236*	*9,546*	*0*	*59*	*9,605*	*203,631*
Variation S2-A2	*213,236*	*9,546*	*0*	*60*	*9,606*	*203,630*
Variation S2-B1	*213,236*	*9,546*	*0*	*83*	*9,629*	*203,607*
Variation S2-B2	*213,236*	*9,546*	*0*	*84*	*9,630*	*203,606*
Variation S2-C1	*213,236*	*9,546*	*0*	*220*	*9,766*	*203,470*
Variation S2-C2	*213,236*	*9,546*	*0*	*187*	*9,733*	*203,503*
Variation S2-E1	*213,236*	*9,546*	*0*	*51*	*9,597*	*203,639*
Variation S2-E2	*213,236*	*9,546*	*0*	*59*	*9,605*	*203,631*
Variation S2-F1	*213,236*	*9,546*	*0*	*255*	*9,801*	*203,435*
Variation S2-F2	*213,236*	*9,546*	*0*	*262*	*9,808*	*203,428*
Glass Hill	213,236	9,546	0	739	10,286	202,950
Variation S2-D1	*213,236*	*9,546*	*0*	*109*	*9,655*	*203,580*
Variation S2-D2	*213,236*	*9,546*	*0*	*98*	*9,644*	*203,592*
Mill Creek	213,236	9,546	0	770	10,316	202,920

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Hilgard Junction High Potential Historic Site

The area adjacent to the Hilgard Junction High Potential Historic Site has been modified by an existing 230-kV transmission line, I-84, and other paved roads. The addition of the B2H Project in context with the existing 230-kV transmission line would intensify cumulative effects on views to the southwest from the site especially on the Mill Creek Alternative as the B2H Project would be located closer to the site than the existing transmission lines. Due to topographic and vegetative screening of these views, the upper portion of the B2H Project transmission line structures would be the primary additive cumulative effect on these views. No RFFAs are located adjacent to the Hilgard Junction High Potential Historic Site.

Table 3-799. Cumulative Effects Summary for the Oregon National Historic Trail Hilgard Junction High Potential Historic Site in Segment 2—Blue Mountains

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	50,265	1,272	0	195	1,467	48,798
Variation S2-A1	*50,265*	*1,272*	*0*	*59*	*1,331*	*48,934*
Variation S2-A2	*50,265*	*1,272*	*0*	*60*	*1,332*	*48,933*
Variation S2-B1	*50,265*	*1,272*	*0*	*83*	*1,355*	*48,910*
Variation S2-B2	*50,265*	*1,272*	*0*	*84*	*1,356*	*48,909*
Variation S2-C1	*50,265*	*1,272*	*0*	*25*	*1,297*	*48,968*
Variation S2-C2	*50,265*	*1,272*	*0*	*19*	*1,291*	*48,974*
Variation S2-E1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-E2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	50,265	1,272	0	177	1,449	48,816
Variation S2-D1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-D2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Mill Creek	50,265	1,272	0	195	1,466	48,799

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Blue Mountains High Potential Historic Route Segment

The setting adjacent to the Blue Mountains High Potential Historic Route Segment has been modified by I-84, an existing 230-kV transmission line, pipeline, small mining operations, paved and gravel roads, and near La Grande, community and agricultural development. The addition of the B2H Project would intensify these cumulative effects where viewed in context with exiting linear modifications. The Mill Creek Alternative would have the highest additive cumulative effect on this trail segment as the B2H Project would be located less than a mile away for 5 miles between Hilgard Junction and the community of La Grande closer to the trail segment than the existing transmission line. No RFFAs are located adjacent to the Blue Mountains High Potential Historic Route Segment.

Table 3-800. Cumulative Effects Summary for the Oregon National Historic Trail Blue Mountains High Potential Historic Route Segment in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	150,777	7,010	0	298	7,308	7,308
Variation S2-A1	*150,777*	*7,010*	*0*	*59*	*7,069*	*7,069*
Variation S2-A2	*150,777*	*7,010*	*0*	*60*	*7,070*	*7,070*
Variation S2-B1	*150,777*	*7,010*	*0*	*83*	*7,093*	*7,093*
Variation S2-B2	*150,777*	*7,010*	*0*	*84*	*7,094*	*7,094*
Variation S2-C1	*150,777*	*7,010*	*0*	*134*	*7,143*	*7,143*
Variation S2-C2	*150,777*	*7,010*	*0*	*139*	*7,149*	*7,149*
Variation S2-E1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-E2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-F2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Glass Hill	150,777	7,010	0	294	7,304	7,304
Variation S2-D1	*150,777*	*7,010*	*0*	*96*	*7,106*	*7,106*
Variation S2-D2	*150,777*	*7,010*	*0*	*68*	*7,078*	*7,078*
Mill Creek	150,777	7,010	0	352	7,361	7,361

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Ladd Canyon High Potential Historic Route Segment

The existing setting adjacent to the Ladd Canyon High Potential Historic Route Segment is generally intact except for existing pipelines, a 230-kV transmission line and I-84 which are all partially screened by the rolling topography adjacent to the trail segment. The addition of the B2H Project, approximately 2.5 miles, away would incrementally modify the setting but due to the distance and the existing modifications located closer to the trail segment, these additive cumulative effects would be minor except for the Mill Creek Alternative. The implementation of the Mill Creek Alternative would intensify cumulative effects as it would be viewed approximately 1 mile away, adjacent to the existing 230-kV transmission line. No RFFAs are located adjacent to the Blue Mountains High Potential Historic Route Segment.

Table 3-801. Cumulative Effects Summary for the Oregon National Historic Trail Ladd Canyon High Potential Historic Route Segment in Segment 2—Blue Mountains in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	62,357	2,348	0	244	2,592	59,765
Variation S2-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S2-C1	*62,357*	*2,348*	*0*	*88*	*2,436*	*59,921*
Variation S2-C2	*62,357*	*2,348*	*0*	*92*	*2,440*	*59,917*
Variation S2-E1	*62,357*	*2,348*	*0*	*51*	*2,399*	*59,959*
Variation S2-E2	*62,357*	*2,348*	*0*	*59*	*2,406*	*59,951*
Variation S2-F1	*62,357*	*2,348*	*0*	*56*	*2,404*	*59,953*
Variation S2-F2	*62,357*	*2,348*	*0*	*64*	*2,412*	*59,946*
Glass Hill	62,357	2,348	0	241	2,589	59,769
Variation S2-D1	*62,357*	*2,348*	*0*	*15*	*2,363*	*59,994*
Variation S2-D2	*62,357*	*2,348*	*0*	*12*	*2,360*	*59,997*
Mill Creek	62,357	2,348	0	273	2,621	59,736
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

National Park Service Auto Tour Route

The setting adjacent to portion of the NPS Auto Tour Route (I-84) near Hilgard Junction has been modified by an existing 230-kV transmission line. The addition of the B2H Project would intensify these effects, within the foreground distance zone, as the B2H Project would be located closer to the NPS Auto Tour Route than the existing transmission line where the presence of the taller transmission line structures and geometrical right-of-way vegetation clearing would dominate the setting. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

In Ladd Canyon, views from the NPS Auto Tour Route have been modified by an existing 230-kV transmission line which crosses the route twice in 2 miles. The addition of the Mill Creek Alternative would intensify these effects as the existing 230-kV transmission line would be paralleled crossing the NPS Auto Tour Route, and due to the scale of the proposed transmission line structures, dominate views from this portion of the route. The implementation of other B2H Project alternatives would intensify cumulative effects on the NPS Auto Tour Route but would be viewed from further away and would not cross the route in Ladd Canyon. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

South of Ladd Canyon, the setting adjacent to the NPS Auto Tour Route has been modified by an existing 230-kV transmission line and existing paved and gravel roads. The addition of the B2H Project on the Mill Creek Alterative, in this area, would intensify cumulative effects, as the existing 230-kV

transmission line would be paralleled where the NPS Auto Tour Route is crossed. The implementation of the Applicant's Preferred and Glass Hill alternatives would expand the area viewed as a transmission line corridor since the B2H Project would cross the NPS Auto Tour Route 1.5 miles south of where the existing transmission line crosses the route. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

Table 3-802. Cumulative Effects Summary for the Oregon National Historic Trail National Park Service Auto Tour Route in Segment 2—Blue Mountains in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	225,758	9,934	0	750	10,684	215,074
Variation S2-A1	*225,758*	*9,934*	*0*	*59*	*9,993*	*215,765*
Variation S2-A2	*225,758*	*9,934*	*0*	*60*	*9,994*	*215,764*
Variation S2-B1	*225,758*	*9,934*	*0*	*83*	*10,017*	*215,741*
Variation S2-B2	*225,758*	*9,934*	*0*	*84*	*10,018*	*215,740*
Variation S2-C1	*225,758*	*9,934*	*0*	*220*	*10,154*	*215,604*
Variation S2-C2	*225,758*	*9,934*	*0*	*187*	*10,121*	*215,637*
Variation S2-E1	*225,758*	*9,934*	*0*	*51*	*9,985*	*215,773*
Variation S2-E2	*225,758*	*9,934*	*0*	*59*	*9,993*	*215,766*
Variation S2-F1	*225,758*	*9,934*	*0*	*255*	*10,189*	*215,569*
Variation S2-F2	*225,758*	*9,934*	*0*	*262*	*10,196*	*215,563*
Glass Hill	225,758	9,934	0	660	10,594	215,164
Variation S2-D1	*225,758*	*9,934*	*0*	*50*	*9,984*	*215,774*
Variation S2-D2	*225,758*	*9,934*	*0*	*27*	*9,961*	*215,798*
Mill Creek	225,758	9,934	0	770	10,704	215,055

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Segment 3—Baker Valley

Cumulative effects on the Oregon NHT in this segment were assessed from the:

- Congressionally designated trail alignment (Table 3-803)
- High potential historic site
  - Flagstaff Hill/NHOTIC (Table 3-804)
- No high potential historic route segments are located in proximity to Segment 3
- NPS Auto Tour Route (Table 3-805)

Congressionally Designated Trail Alignment

The setting adjacent to the Oregon NHT in Segment 3 has been modified by agricultural and community development in Baker Valley and near Durkee, I-84, existing 230-kV transmission line, existing 138-kV transmission line, paved and gravel roads, and small mining operations. The addition of the B2H Project would further modify the trail's setting and due to the scale of the proposed

transmission line towers, would influence the setting beyond the B2H Project's footprint leading to additive cumulative effects where the setting has already been modified by development. The Flagstaff B – Burnt River West and Flagstaff B – Durkee alternatives would have reduced additive cumulative effects on the Oregon NHT as these alternatives are not located in proximity to the trail between Durkee and Weatherby. No RFFAs are located adjacent to the Oregon NHT in this segment.

Table 3-803. Cumulative Effects Summary for the Oregon National Historic Trail Congressionally Designated Alignment in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	342,956	9,749	0	1,136	10,885	332,072
Variation S3-A1	*342,956*	*9,749*	*0*	*256*	*10,005*	*332,951*
Variation S3-A2	*342,956*	*9,749*	*0*	*250*	*9,999*	*332,957*
Variation S3-B1	*342,956*	*9,749*	*0*	*306*	*10,055*	*332,901*
Variation S3-B2	*342,956*	*9,749*	*0*	*273*	*10,022*	*332,934*
Variation S3-B3	*342,956*	*9,749*	*0*	*262*	*10,011*	*332,945*
Variation S3-B4	*342,956*	*9,749*	*0*	*248*	*9,998*	*332,959*
Variation S3-B5	*342,956*	*9,749*	*0*	*260*	*10,009*	*332,947*
Variation S3-C1	*342,956*	*9,749*	*0*	*407*	*10,156*	*332,800*
Variation S3-C2	*342,956*	*9,749*	*0*	*410*	*10,159*	*332,797*
Variation S3-C3	*342,956*	*9,749*	*0*	*394*	*10,143*	*332,813*
Variation S3-C4	*342,956*	*9,749*	*0*	*402*	*10,151*	*332,806*
Variation S3-C5	*342,956*	*9,749*	*0*	*568*	*10,318*	*332,639*
Variation S3-C6	*342,956*	*9,749*	*0*	*422*	*10,171*	*332,785*
Flagstaff A	342,956	9,749	0	1,089	10,839	332,118
Timber Canyon	342,956	9,749	0	301	10,050	332,906
Flagstaff A – Burnt River Mountain	342,956	9,749	0	1,080	10,829	332,128
Flagstaff B	342,956	9,749	0	1,091	10,840	332,116
Flagstaff B – Burnt River West	342,956	9,749	0	1,238	10,987	331,970
Flagstaff B - Durkee	342,956	9,749	0	1,132	10,881	332,076

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Flagstaff Hill/NHOTIC High Potential Historic Site

The area adjacent to the Flagstaff Hill/NHOTIC High Potential Historic Site has been modified by extensive agricultural and community development as well as an existing 230-kV transmission line in Baker Valley to the west. In contrast, the area to the east of the site is generally intact except for the Virtue Flat ATV area, a shooting range, and paved and two-track roads. The introduction of the B2H Project, to the west of the NHOTIC, would intensify cumulative effects on the setting in this area and dominate views to the west. If the Applicant's Preferred Alternative was selected, the B2H Project would modify the setting to the east of the NHOTIC and as such, the site would be have views of

transmission lines to both the west and east dominating the majority of the site's viewshed. No RFFAs are located adjacent to the Flagstaff Hill/NHOTIC High Potential Historic Site

Table 3-804. Cumulative Effects Summary for the Oregon National Historic Trail Flagstaff Hill/National Historic Oregon Trail Interpretive Site High Potential Historic Site in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	50,265	1,906	0	264	2,170	48,095
Variation S3-A1	*50,265*	*1,906*	*0*	*19*	*1,925*	*48,340*
Variation S3-A2	*50,265*	*1,906*	*0*	*18*	*1,924*	*48,341*
Variation S3-B1	*50,265*	*1,906*	*0*	*243*	*2,149*	*48,115*
Variation S3-B2	*50,265*	*1,906*	*0*	*205*	*2,111*	*48,154*
Variation S3-B3	*50,265*	*1,906*	*0*	*199*	*2,105*	*48,160*
Variation S3-B4	*50,265*	*1,906*	*0*	*186*	*2,092*	*48,173*
Variation S3-B5	*50,265*	*1,906*	*0*	*193*	*2,099*	*48,166*
Variation S3-C1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	50,265	1,906	0	220	2,126	48,139
Timber Canyon	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Flagstaff A – Burnt River Mountain	50,265	1,906	0	222	2,128	48,137
Flagstaff B	50,265	1,906	0	227	2,133	48,131
Flagstaff B – Burnt River West	50,265	1,906	0	240	2,146	48,119
Flagstaff B - Durkee	50,265	1,906	0	245	2,151	48,114

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

National Park Service Auto Tour Route

The setting adjacent to portion of the NPS Auto Tour Route (I-84) southeast of Baker City has been modified by an existing 138-kV transmission line and small areas of agricultural development. The addition of the B2H Project would intensify these effects and dominate views from the NPS Auto Tour Route for approximately 5 miles. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

Between Pleasant Valley and Durkee, views from the NPS Auto Tour Route have been modified by an existing 138-kV transmission line and closer to Durkee, the conversion of lands adjacent to the Burnt River to agricultural uses. The addition of the B2H Project, especially Variation S3-C2, would intensify

these effects and dominate views where the proposed transmission line structures are located in the NPS Auto Tour Route's foreground distance zone. Flagstaff B – Burnt River West and Flagstaff B – Durkee Alternatives would have reduced cumulative effects on the NPS Auto Tour Route since these routes do not parallel I-84 near Durkee. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

Near Weatherby, the setting adjacent to the NPS Auto Tour Route has been modified by an existing 138-kV transmission line and isolated agricultural lands in the narrow canyon. The addition of the B2H Project would intensify development and dominate the setting along the NPS Auto Tour Route. Alternatives Flagstaff B – Burnt River West and Flagstaff B – Durkee would have reduced incremental cumulative effects as the NPS Auto Tour Route would not be paralleled in this area by these alternatives. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

Table 3-805. Cumulative Effects Summary for the Oregon National Historic Trail National Park Service Auto Tour Route in Segment 3—Baker Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	344,352	11,242	0	1,056	12,298	332,054
Variation S3-A1	*344,352*	*11,242*	*0*	*256*	*11,498*	*332,854*
Variation S3-A2	*344,352*	*11,242*	*0*	*250*	*11,492*	*332,860*
Variation S3-B1	*344,352*	*11,242*	*0*	*226*	*11,468*	*332,884*
Variation S3-B2	*344,352*	*11,242*	*0*	*308*	*11,550*	*332,802*
Variation S3-B3	*344,352*	*11,242*	*0*	*302*	*11,544*	*332,808*
Variation S3-B4	*344,352*	*11,242*	*0*	*288*	*11,530*	*332,821*
Variation S3-B5	*344,352*	*11,242*	*0*	*294*	*11,536*	*332,816*
Variation S3-C1	*344,352*	*11,242*	*0*	*407*	*11,649*	*332,703*
Variation S3-C2	*344,352*	*11,242*	*0*	*410*	*11,652*	*332,700*
Variation S3-C3	*344,352*	*11,242*	*0*	*394*	*11,636*	*332,716*
Variation S3-C4	*344,352*	*11,242*	*0*	*402*	*11,644*	*332,708*
Variation S3-C5	*344,352*	*11,242*	*0*	*568*	*11,810*	*332,541*
Variation S3-C6	*344,352*	*11,242*	*0*	*431*	*11,673*	*332,679*
Flagstaff A	344,352	11,242	0	1,125	12,367	331,985
Timber Canyon	344,352	11,242	0	219	11,461	332,891
Flagstaff A – Burnt River Mountain	344,352	11,242	0	1,115	12,357	331,995
Flagstaff B	344,352	11,242	0	1,133	12,375	331,977
Flagstaff B – Burnt River West	344,352	11,242	0	1,282	12,524	331,828
Flagstaff B - Durkee	344,352	11,242	0	1,185	12,427	331,925

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Segment 4—Brogan

Cumulative effects on the Oregon NHT in this segment were assessed from the:

- Congressionally designated trail alignment (Table 3-806)
- High potential historic site
  - Farewell Bend (Table 3-807)
- High potential historic route segment
  - Alkali Springs (Table 3-808)
- NPS Auto Tour Route (Table 3-809)

Congressionally Designated Trail Alignment

The setting adjacent to the Oregon NHT from the community of Huntington to Farewell Bend has been modified by an existing 138-kV transmission line, I-84, and recreation and commercial development adjacent to Farewell Bend. As the Oregon NHT turns to the south, it traverses a highly intact setting for 15 miles past Birch Creek and Alkali Flats before entering Willow Creek Valley. The setting adjacent to the NHT in Willow Creek Valley to the community of Vale has been modified by agricultural and community development as well as an existing transmission line. The introduction of the Applicant's Preferred and Willow Creek alternatives would intensify cumulative effects from Huntington to Farewell Bend and in Willow Creek Valley, but since these routes are not located in proximity to the Oregon NHT near Birch Creek and Alkali Flats, there are limited effects on the highly intact setting. The selection of the Tub Mountain South Alternative would dominate the setting adjacent to Birch Creek and the southern edge of Alkali Flats as there are limited existing modifications except for gravel and two-track roads. No RFFAs are located adjacent to the Oregon NHT in this segment.

Table 3-806. Cumulative Effects Summary for the Oregon National Historic Trail Congressionally Designated Alignment in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	239,742	7,113	0	249	7,362	232,380
Variation S4-A1	*239,742*	*7,113*	*0*	*154*	*7,267*	*232,475*
Variation S4-A2	*239,742*	*7,113*	*0*	*145*	*7,258*	*232,484*
Variation S4-A3	*239,742*	*7,113*	*0*	*148*	*7,261*	*232,481*
Tub Mountain South	239,742	7,113	0	762	7,875	231,867
Willow Creek	239,742	7,113	0	391	7,504	232,238

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Farewell Bend High Potential Historic Site

The area adjacent to the Farewell Bend High Potential Historic Site has been modified by an existing 138-kV transmission line, I-84, and recreation and commercial development. The addition of the B2H Project on the Tub Mountain South Alternative would intensify cumulative effects in context with the

existing 138-kV transmission line on views to the south from the site. These views would be partially screened by riparian vegetation adjacent to the Snake River. The introduction of other B2H Project alternatives would have minor additive cumulative effects on this site. No RFFAs are located adjacent to the Farewell Bend High Potential Historic Site.

Table 3-807. Cumulative Effects Summary for the Oregon National Historic Trail Farewell Bend High Potential Historic Site in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Variation S4-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A3	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Tub Mountain South	50,265	1,494	0	218	1,712	48,553
Willow Creek	50,265	1,494	0	150	1,644	48,621

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Alkali Springs High Potential Historic Route Segment

The setting adjacent to the Alkali Flats High Potential Historic Route Segment has been minimally affected by existing development, consisting primarily of gravel and two-track roads. The introduction of the B2H Project on the Tub Mountain South Alternative, where visible, would modify the setting 1.5 miles away with views of backdropped transmission line structures except at the south end of the segment, where the setting would be dominated by the B2H Project. The selection of other B2H Project alternative routes would have minimal additive cumulative effects on this trail segment. No RFFAs are located adjacent to the Alkali Springs High Potential Historic Route Segment.

Table 3-808. Cumulative Effects Summary for the Oregon National Historic Trail Alkali Springs High Potential Historic Route Segment in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	133,216	3,040	0	0	3,040	130,176
Variation S4-A1	*133,216*	*3,040*	*0*	*0*	*3,040*	*130,176*
Variation S4-A2	*133,216*	*3,040*	*0*	*0*	*3,040*	*130,176*
Variation S4-A3	*133,216*	*3,040*	*0*	*0*	*3,040*	*130,176*
Tub Mountain South	133,216	3,040	0	528	3,568	129,648
Willow Creek	133,216	3,040	0	154	3,193	130,022

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

National Park Service Auto Tour Route

The setting adjacent to portion of the NPS Auto Tour Route (I-84) between the community of Dixie and Farewell Bend has been modified by an existing 138-kV transmission line and recreation and commercial development near Farewell Bend. The addition of the B2H Project would dominate the setting along this portion of the route as the B2H Project would parallel the route for approximately 10 miles, intensifying cumulative effects. No RFFAs are located adjacent to this portion of the NPS Auto Tour Route.

Table 3-809. Cumulative Effects Summary for the Oregon National Historic Trail National Park Service Auto Tour Route in Segment 4—Brogan in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	149,020	3,869	0	266	4,135	144,885
Variation S4-A1	*149,020*	*3,869*	*0*	*154*	*4,022*	*144,997*
Variation S4-A2	*149,020*	*3,869*	*0*	*145*	*4,014*	*145,006*
Variation S4-A3	*149,020*	*3,869*	*0*	*148*	*4,017*	*145,003*
Tub Mountain South	149,020	3,869	0	432	4,301	144,719
Willow Creek	149,020	3,869	0	340	4,208	144,812

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Segment 5—Malheur

Cumulative effects on the Oregon NHT in this segment were assessed from the:

- Congressionally designated trail alignment (Table 3-810)
- No high potential historic sites are located in proximity to Segment 5
- No high potential historic route segments are located in proximity to Segment 5
- The NPS Auto Tour Route is not located in proximity to Segment 5

Congressionally Designated Trail Alignment

The setting adjacent to the Oregon NHT in Segment 5 has been modified by extensive agricultural development adjacent to the Snake River and paved and gravel roads. The introduction of the B2H Project approximately 2 miles away would minimally modify the trail's setting to the west due to topographic screening and transmission line structures partially backdropped by Blackjack Butte. No RFFAs are located adjacent to the Oregon NHT in this segment.

Table 3-810. Cumulative Effects Summary for the Oregon National Historic Trail Congressionally Designated Alignment in Segment 5—Malheur in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	127,214	6,595	0	249	6,844	120,370
Variation S5-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-B1	*127,214*	*6,595*	*0*	*53*	*6,648*	*120,566*
Variation S5-B2	*127,214*	*6,595*	*0*	*55*	*6,649*	*120,565*
Malheur S	127,214	6,595	0	119	6,714	120,500
Malheur A	127,214	6,595	0	37	6,631	120,583

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Segment 6—Treasure Valley

Cumulative effects on the Oregon NHT in this segment were assessed from the:

- Congressionally designated trail alignment (Table 3-811)
- High potential historic site
  - Givens Hot Springs (Table 3-812)
- No high potential historic route segments are located in proximity to Segment 6
- The NPS Auto Tour Route is not located in proximity to Segment 6

Congressionally Designated Trail Alignment

The setting adjacent to the Oregon NHT in Segment 6 has been modified by extensive agricultural development adjacent to the Snake River and an existing 500-kV transmission line along the southwest edge of Treasure Valley. The introduction of the B2H Project approximately 2.5 miles away would intensify cumulative effects, but due to the distance and the existing modifications located closer to the trail, would not lead to a substantial increase in cumulative effects on the Oregon NHT. No RFFAs are located adjacent to the Oregon NHT in this segment.

Table 3-811. Cumulative Effects Summary for the Oregon National Historic Trail Congressionally Designated Alignment in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	165,854	8,870	0	318	9,188	156,666
Variation S6-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S6-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S6-B1	*165,854*	*8,870*	*0*	*256*	*9,126*	*156,728*
Variation S6-B2	*165,854*	*8,870*	*0*	*243*	*9,113*	*156,741*

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Givens Hot Springs High Potential Historic Site

The area adjacent to the Givens Hot Springs High Potential Historic Site has been modified by an existing 500-kV transmission line and extensive agricultural development in Treasure Valley. The introduction of the B2H Project would intensify cumulative effects but due to the proximity of existing development to this site, and the B2H Project being located 2.5 miles away, would not substantially increase cumulative effects on this site. No RFFAs are located adjacent to the Givens Hot Springs High Potential Historic Site.

Table 3-812. Cumulative Effects Summary for the Oregon National Historic Trail Givens Hot Springs High Potential Historic Site in Segment 6—Treasure Valley in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	50,265	2,179	0	202	2,381	47,884
Variation S6-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S6-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S6-B1	*50,265*	*2,179*	*0*	*142*	*2,321*	*47,944*
Variation S6-B2	*50,265*	*2,179*	*0*	*139*	*2,317*	*47,948*

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Lewis and Clark National Historic Trail

Segment 1—Morrow-Umatilla

Cumulative effects on the Lewis and Clark NHT in Segment 1 were assessed from the (1) congressionally designated trail alignment (Table 3-813), (2) Boardman Park (only high potential historic site located in proximity to the B2H Project) (Table 3-814), and (3) NPS Auto Tour Route (Table 3-815).

Congressionally Designated Trail Alignment

The setting adjacent to the Lewis and Clark NHT congressionally designated alignment, both the outbound and return road, has been modified by existing transmission lines, pipelines, I-84, industrial development, and agricultural and community development in and around Boardman. Additionally, the Columbia River has been dammed subsequent to the Lewis and Clark Exhibition resulting in a substantially wider river than during the trail's period of significance. The addition of the B2H Project would intensify cumulative effects to the south of the trail but would occur in an area already viewed as modified. No RFFAs are located adjacent to the Lewis and Clark NHT.

Table 3-813. Cumulative Effects Summary for the Lewis and Clark National Historic Trail Congressionally Designated Alignment in Segment 1—Morrow-Umatilla in Acres in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	67,057	5,846	0	21	5,867	61,190
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	67,057	5,846	0	79	5,925	61,132
Applicant's Proposed Action – Southern Route	67,057	5,846	0	21	5,867	61,190
West of Bombing Range Road – Southern Route	67,057	5,846	0	22	5,868	61,189
Longhorn	67,057	5,846	0	73	5,919	61,137
Interstate 84	67,057	5,846	0	63	5,909	61,147
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	67,057	5,846	0	64	5,910	61,147

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Boardman Park High Potential Historic Site

The Boardman Park High Potential Historic Site is located in the community of Boardman along the Columbia River. The immediate area adjacent to the site has been modified by existing development in Boardman as well as industrial development, existing transmission lines, pipelines, and I-84 to the east of the site. Due to the extent of existing development within the site's foreground distance zone, the addition of the B2H Project would intensify cumulative effects to the east of the site but would occur in an area already viewed as modified. No RFFAs are located adjacent to the Boardman Park High Potential Historic Site.

Table 3-814. Cumulative Effects Summary for the Lewis and Clark National Historic Trail Boardman Park High Potential Historic Site in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	42,442	3,656	0	21	3,676	38,766
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	42,442	3,656	0	67	3,723	38,719
Applicant's Proposed Action – Southern Route	42,442	3,656	0	21	3,677	38,766
West of Bombing Range Road – Southern Route	42,442	3,656	0	22	3,678	38,765
Longhorn	42,442	3,656	0	19	3,675	38,767
Interstate 84	42,442	3,656	0	19	3,675	38,767
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	42,442	3,656	0	19	3,675	38,767

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

National Park Service Auto Tour Route

The setting along the NPS Auto Tour Route, I-84 and U.S. Highway 730, has been modified by existing transmission lines, pipelines, a railroad alignment, industrial development, and agricultural and community development in and around Boardman. The introduction of the B2H Project adjacent to and crossing the route would attract attention and intensify impacts on the NPS Auto Tour Route. Due to the height of the proposed transmission line structures, the cumulative effects associated with the B2H Project would be most intense where the NPS Auto Tour Route would be crossed and in adjacent areas, expanding the area viewed as modified by development east of the community of Boardman. No RFFAs are located adjacent to the NPS Auto Tour Route.

Table 3-815. Cumulative Effects Summary for the Lewis and Clark National Historic Trail National Park Service Auto Tour Route in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	105,073	8,665	0	21	8,685	96,388
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	105,073	8,665	0	121	8,785	96,288
Applicant's Proposed Action – Southern Route	105,073	8,665	0	21	8,685	96,388
West of Bombing Range Road – Southern Route	105,073	8,665	0	22	8,686	96,387
Longhorn	105,073	8,665	0	139	8,804	96,269
Interstate 84	105,073	8,665	0	88	8,753	96,320
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	105,073	8,665	0	89	8,754	96,319

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Goodale's Cutoff Study Trail

Segment 3—Baker Valley

Cumulative effects on the Goodale's Cutoff Study Trail in Segment 3 were assessed from the trail alignments under study by the NPS (Table 3-816).

The Goodale's Cutoff Study Trail is located in proximity to the B2H Project in two areas, (1) east of Baker City in Virtue Flat and (2) west of the community of Richland. The setting adjacent to the Goodale's Cutoff Study Trail in Virtue Flat is generally intact with existing modifications limited to the Virtue Flat ATV area, a shooting range, and paved and gravel roads. The introduction of the B2H Project under the Applicant's Proposed Action Alternative would dominate the setting intensifying cumulative effects through views of skylined transmission line structures, construction access roads, and right-of-way vegetation clearing. Other B2H Project alternatives would have decreased additive cumulative effects on this portion of the Study Trail. Near the community of Richland, the setting adjacent to the Goodale's Study Trail has been modified by existing agricultural and paved and gravel roads but near Eagle Creek and the Powder River, the setting is highly intact. The introduction of the B2H Project along the Timber Canyon Alternative would dominate the setting in the foreground distance zone due to views of skylined transmission line structures. No RFFAs are located adjacent to the Goodale's Cutoff Study Trail.

Table 3-816. Cumulative Effects Summary for the Goodale's Cutoff Study Trail in Segment 3—Baker Valley in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	313,119	5,794	0	283	6,076	307,043
Variation S3-A1	*313,119*	*5,794*	*0*	*7*	*5,800*	*307,319*
Variation S3-A2	*313,119*	*5,794*	*0*	*6*	*5,800*	*307,320*
Variation S3-B1	*313,119*	*5,794*	*0*	*275*	*6,069*	*307,051*
Variation S3-B2	*313,119*	*5,794*	*0*	*218*	*6,011*	*307,108*
Variation S3-B3	*313,119*	*5,794*	*0*	*211*	*6,005*	*307,115*
Variation S3-B4	*313,119*	*5,794*	*0*	*198*	*5,992*	*307,127*
Variation S3-B5	*313,119*	*5,794*	*0*	*206*	*6,000*	*307,120*
Variation S3-C1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C3	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C4	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C5	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S3-C6	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Flagstaff A	313,119	5,794	0	220	6,013	307,106
Timber Canyon	313,119	5,794	0	580	6,374	306,746
Flagstaff A – Burnt River Mountain	313,119	5,794	0	222	6,015	307,104
Flagstaff B	313,119	5,794	0	227	6,021	307,098
Flagstaff B – Burnt River West	313,119	5,794	0	240	6,034	307,086
Flagstaff B - Durkee	313,119	5,794	0	245	6,039	307,080
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Meek Cutoff Study Trail

Segment 5—Malheur

Cumulative effects on the Meek Cutoff Study Trail in Segment 5 were assessed from the trail alignments under study by the NPS (Table 3-817).

The setting adjacent to the Meek Cutoff Study Trail west of Vale, along the Malheur River, and in Little Valley has been modified by agricultural and community development in addition to paved and gravel roads traversing the area. In Malheur Canyon the setting is more intact with an abandoned rail line, canal and gravel and two-track roads along the canyon floor. The introduction of the B2H Project would intensify cumulative effects and locally dominate the setting in Malheur Canyon, and south on Vines Hill, through the introduction of transmission line structures, construction access roads, and right-of-way vegetation clearing in an area with limited existing modifications. No RFFAs are located adjacent to the Meek Cutoff Study Trail.

Table 3-817. Cumulative Effects Summary for the Meek Cutoff Study Trail in Segment 5—Malheur in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	162,000	4,890	0	364	5,254	156,746
Variation S5-A1	*162,000*	*4,890*	*0*	*103*	*4,993*	*157,007*
Variation S5-A2	*162,000*	*4,890*	*0*	*61*	*4,951*	*157,049*
Variation S5-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S5-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Malheur S	162,000	4,890	0	335	5,226	156,774
Malheur A	162,000	4,890	0	324	5,214	156,785
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Upper Columbia River Route Study Trail

Segment 1—Morrow-Umatilla

Cumulative effects on the Upper Columbia River Route Study Trail in Segment 1 were assessed from the trail alignment under study by the NPS (Table 3-818).

Study Trail Alignment

The setting adjacent to the Upper Columbia River Route Study Trail, has been modified by existing transmission lines, pipelines, I-84, industrial development, and agricultural and community development in and around Boardman. Additionally, the Columbia River has been dammed subsequent to the historic use of the trail resulting in a substantially wider river than during the trail's period of significance. The addition of the B2H Project would intensify cumulative effects to the south of the trail but would occur in an area already viewed as modified. No RFFAs are located adjacent to the Upper Columbia River Route Study Trail.

Table 3-818. Cumulative Effects Summary for the Upper Columbia River Route Study Trail in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	67,394	6,041	0	21	6,061	61,333
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	67,394	6,041	0	77	6,117	61,277

Table 3-818. Cumulative Effects Summary for the Upper Columbia River Route Study Trail in Segment 1—Morrow-Umatilla in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action – Southern Route	67,394	6,041	0	21	6,061	61,333
West of Bombing Range Road – Southern Route	67,394	6,041	0	22	6,062	61,332
Longhorn	67,394	6,041	0	71	6,112	61,282
Interstate 84	67,394	6,041	0	64	6,104	61,290
Variation S1-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Interstate 84 – Southern Route	67,394	6,041	0	65	6,105	61,289
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Olds Ferry Road Study Trail

Segment 4—Brogan

Cumulative effects on the Olds Ferry Road Study Trail in Segment 4 were assessed from the trail alignment under study by the NPS (Table 3-819).

The setting adjacent to the Olds Ferry Road Study Trail has been modified by an existing 138-kV transmission line, I-84, and development in and around Farewell Bend. The addition of the B2H Project along the Tub Mountain South Alternative would intensify these effects by being located beyond the existing modifications present in the Study Trail's viewshed. Other B2H Project alternatives would have minor additive cumulative effects on the trail's setting. No RFFAs are located adjacent to the Olds Ferry Road Study Trail.

Table 3-819. Cumulative Effects Summary for the Olds Ferry Road Study Trail in Segment 4—Brogan in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Variation S4-A1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S4-A3	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Tub Mountain South	95,365	2,692	0	270	2,962	92,402
Willow Creek	95,365	2,692	0	148	2,840	92,525

Table 3-819. Cumulative Effects Summary for the Olds Ferry Road Study Trail in Segment 4—Brogan in Acres						
Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Umatilla River Route and Columbia River to the Dalles Study Trail

Segment 1—Morrow-Umatilla

Cumulative effects on the Umatilla River Route and Columbia River to the Dalles Study Trail in Segment 1 were assessed from the trail alignment under study by the NPS (Table 3-820).

The setting adjacent to the Columbia River portion of Umatilla River Route and Columbia River to The Dalles Study Trail, has been modified by existing transmission lines, pipelines, I-84, industrial development, and agricultural and community development in and around Boardman. Additionally, the Columbia River has been dammed subsequent to the historic use of the trail resulting in a substantially wider river than during the trail's period of significance. The addition of the B2H Project would intensify cumulative effects to the south of the trail but would occur in an area already viewed as modified. No RFFAs are located adjacent to the Columbia River portion of the Upper Columbia River Route Study Trail.

Further to the east, the setting adjacent to the overland portion of the Umatilla River Route and Columbia River to The Dalles Study Trail, has been modified by agricultural and community development near Echo, I-84, an existing 230-kV transmission line, and other paved and gravel roads. The B2H Project, along alternatives paralleling I-84, would intensify cumulative effects on the Study Trail. Due to the height of the proposed transmission line structures, the cumulative effects associated with the B2H Project would be most intense where the Study Trail would be crossed and in adjacent areas, expanding the area viewed as modified by development north of the community of Echo. These effects would be most intense if Variation S1-A2 was selected as the B2H Project would be viewed to the east of the Study Trail closer than the existing 230-kV transmission. The future development of the Wallula to McNary 230-kV Transmission Line would intensify effects on the Study Trail's setting near the Columbia River adjacent to several existing transmission lines approximately 9 miles north of the B2H Project.

Table 3-820. Cumulative Effects Summary for the Umatilla River Route and Columbia River to the Dalles Study Trail in Segment 1—Morrow-Umatilla in Acres

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Applicant's Proposed Action	179,099	20,872	41	21	20,933	158,165
Variation S1-B1	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
Variation S1-B2	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*	*Not applicable*
East of Bombing Range Road	179,099	20,872	41	77	20,989	158,109
Applicant's Proposed Action – Southern Route	179,099	20,872	41	21	20,934	158,165
West of Bombing Range Road – Southern Route	179,099	20,872	41	22	20,935	158,164
Longhorn	179,099	20,872	41	71	20,984	158,114
Interstate 84	179,099	20,872	41	190	21,103	157,996
Variation S1-A1	*179,099*	*20,872*	*41*	*37*	*20,950*	*158,149*
Variation S1-A2	*179,099*	*20,872*	*41*	*139*	*21,052*	*158,047*
Interstate 84 – Southern Route	179,099	20,872	41	192	21,105	157,994

Table Note: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

3.3.3.16 Air Quality and Climate Change

The CIAA for air quality is the air quality control regions crossed by the alternative routes. The CIAA for climate change is the counties crossed by the alternative routes. The CIAAs were selected to provide an understanding of current air quality in Oregon and Idaho, to identify past and present projects that contribute to air quality degradation and climate change, and to understand how the electric generation carried by the B2H Project and other transmission lines, present and proposed, contribute to air quality and climate changes issues.

Issues Identified for Analysis

The issues identified for analysis are identified in Section 3.2.16.

Existing Condition

The existing condition is described in Section 3.2.16.

Results Common to All Alternatives

Cumulative effects on air quality would be common to all alternative routes across all B2H Project segments. Past and present actions (Table 3-639) have contributed to the current air quality conditions. Direct and indirect effect of emission sources from RFFAs (Table 3-640) in the CIAA would contribute to cumulative impacts on air quality and climate change. Emission sources would include construction

actives, ground excavation, land clearing, vehicle emissions, fugitive dust, and stationary source emissions from operation and maintenance activities. These emissions would result in minor and temporary effects on air quality in the immediate vicinity. Furthermore, the reduction in coal-related emissions from the planned improvements to the Boardman Plant would help to offset the emissions from the B2H Project.

Emission resulting from RFFAs would be designed, managed and planned consistent with air quality laws, rules, regulations, and attainment plans established by EPA, Oregon Department of Environmental Quality, and Idaho Department of Environmental Quality.

The incremental effects of the B2H Project to cumulative effects on air quality and climate change would be low.

3.3.3.17 Socioeconomics and Environmental Justice

Socioeconomic conditions could be cumulatively affected by the B2H Project and past, present and future actions. Although construction activities and industrial development and/or operations in proximity to the B2H Project could have implications for cumulative effects on socioeconomic conditions, cumulative socioeconomic impacts are generally only a concern if they would overextend public services and accommodations in the B2H Project area or cause long-term scenic, visual, or physical obstructions that could have implications for aesthetic and recreational values and residential property values, and have the potential to restrict the location of future business or industrial development.

Construction activity has the potential to temporarily affect properties, recreational and scenic values, and bring temporary construction workforce to local communities, requiring housing and public services. It is possible that the construction associated with these present and future activities, including transmission, wind facilities, oil and gas resources, and mining resources, would require similar construction schedules that may overlap with the B2H Project. If construction schedules were to coincide, construction activities within the study area could lead to cumulative effects which could add stresses on housing, public services, and infrastructure. Because of the relatively small size of the temporary work force associated with the construction of the two spreads, and transitory nature of this work, cumulative impacts are not expected to be significant. Although the location of where these temporary residents would be housed is not known for the B2H Project, or other future development activities, potential cumulative impacts on housing availability across the region are anticipated to be minimal. Permanent and temporary housing and lodging are adequate in the region to house temporary workers relocating to the area.

Municipal and county services, including public service provisions, such as education, road repair and construction, police and law enforcement, judicial facilities and services, medical services and facilities, emergency services, and other social services, can all be expected to increase with the influx of workers. However, the B2H Project and other present and future development projects are expected to have temporary and minimal adverse impacts on government-provided services across the region. This

is due to the fact that changes in employment and population associated with these projects are predicted to be small and temporary in nature.

Construction expenditures are expected to beneficially affect local economies through direct jobs and income, as well as through workers spending their wages in local communities. Construction expenditures for engineering, planning, materials, supplies, and other construction services also would generate jobs and income in the Boise area. The construction and operation of the transmission line would generate additional property taxes to counties where the line would be located. Future construction of other transmission lines and renewable energy projects within the B2H Project area also would generate additional property taxes to counties and have a positive effect on local tax bases.

Proximate property values could be cumulatively affected by the construction and operation of the B2H Project and other RFFAs. Most of these impacts on property values (and salability) would occur on an individual basis as a result of proximity and visual impacts. While there could be adverse effects on property values associated with the transmission line and other development projects in the viewshed of these properties, these impacts would be highly variable, individualized, and unpredictable, and most of these losses are likely to be temporary in nature. Landscaping and other natural features that create visual obstructions would mitigate adverse impacts on property values and reduce residual impacts over time.

Potential environmental justice populations could benefit from additional B2H Project development in their communities through jobs, income, and fiscal receipts to local governments. While these populations could be adversely affected by construction of other transmission lines, oil and gas and shale resources, wind power facilities, residential developments, and other transportation and industrial facilities from increased traffic, noise, dust, and other construction inconveniences; it does not appear that these populations would be disproportionately affected by the development or operation of the B2H Project.

3.3.3.18 Public Health

The CIAA for noise during construction is the area within 1,000 feet from the construction noise sources. During operation, the CIAA area is the 250-foot right-of-way. These CIAAs are areas beyond which no noise from construction or operation of the B2H Project would be detectable above USEPA recommended levels, The CIAA for electromagnetic effects it the 250-foot right-of-way in areas occupied by peopled (either permanently or temporarily, such as in recreation sites) crossed by alternative routes. This CIAA is identified because electrical effects, including magnetic fields and stray voltage, do not occur beyond the width of the right-of-way.

Issues Identified for Analysis

Refer to Section 3.2.18.

EXISTING CONDITION

Refer to Section 3.2.18.

RESULTS

Noise impacts associated with the B2H Project would occur primarily during the construction phase. The timing of other RFFAs in the CIAA for noise is not known at this time. If other noise-generating projects were to occur during construction of the B2H Project, there could be cumulative noise effects locally in the area of construction. In areas where the B2H Project would be adjacent to other existing or reasonably foreseeable future transmission lines, the combined noise could be locally higher as a result of cumulative effects.

Energizing the transmission lines creates electromagnetic fields that would vary hourly, daily, and seasonally based on line loading and environmental factors. The modeled electromagnetic fields described in Section 3.2.12 are within the established standards. Where existing transmission lines are in proximity to the B2H Project, cumulative effects of locally higher electromagnetic effects could occur. No other reasonably foreseeable generators of electromagnetic files are in the CIAA (i.e., the 250-foot right-of-way). As a result, overall cumulative effects are anticipated to be low.

3.3.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resources committed to the B2H Project would be material and nonmaterial, including financial resources. Irreversible commitment of resources for the purposes of this section mean that those resources once committed would continue to be committed during the life of the B2H Project. Irretrievable commitment of resources means that those resources used, consumed, destroyed, or degraded during construction, operation, or maintenance could not be retrieved for future use. Irreversible and irretrievable commitments of resources are summarized in Table 3-821.

Table 3-821. Irreversible and Irretrievable Commitment of Resources

Resource	Type of Commitment/ Reason for Commitment	Irreversible	Irretrievable
Earth Resources	• Soil loss and erosion • Aggregate • Construction activities	No	Construction phase
Water Resources	• Water • Construction materials	Yes	Yes, during the construction phase
Vegetation Resources	• Disturbance to and/or loss of vegetation • Construction and operation	Yes	Yes, throughout the life of the B2H Project
Wildlife Resources	• Disturbance to and/or loss of habitat and wildlife species • Construction and operation	Yes	Yes, throughout the life of the B2H Project
Fish Resources	• Disturbance to and/or loss of habitat and fish species • Construction and operation	Yes	Yes, throughout the life of the B2H Project

Table 3-821. Irreversible and Irretrievable Commitment of Resources

Resource	Type of Commitment/ Reason for Commitment	Irreversible	Irretrievable
Land Use, Agriculture, Recreation, and Transportation	• Disturbance to agricultural operations and soils • Conversion of land use from agricultural to developed • Increased access along new roads • Construction and operation	Yes	Yes, throughout the life of the B2H Project
Visual Resources	• Degradation of scenic quality • Change in landscape character • Degradation of views from sensitive platforms • Construction and operation	Yes	Yes, throughout the life of the B2H Project
Cultural Resources	• Disturbance or removal of sites • Access roads leading to increased vandalism • Construction and operation	Yes	Yes, throughout the life of the B2H Project
National Historic Trails	• Degradation of National Trail historic and cultural setting • Degradation of National Trail views from sensitive platforms • Degradation of National Trail historic and cultural resources • Construction and operation	Yes	Yes, throughout the life of the B2H Project
Air Quality and Climate Change	• Combustion emissions • Fugitive dust emissions • Construction and operations	No	No
Socioeconomics and Environmental Justice	• Increased regional and local employment • Increased procurement of materials and equipment • Increased economic activity • Construction and operations	Yes	Yes, throughout the life of the B2H Project
Public Health and Safety	• Increased noise levels during construction • Increased electric and magnetic fields • Construction and operation	Yes	Yes, throughout the life of the B2H Project

3.4 PLAN AMENDMENTS

3.4.1 INTRODUCTION

As described in Chapter 1, actions approved or authorized by the federal land-managing agencies must conform to current land-use plans for the lands they administer (43 CFR 1610.5-3 [BLM] and at 36 CFR 219.10(e) of the planning regulations in effect before November 9, 2000 [USFS]). A land-use plan amendment would be necessary in order to approve a proposed action that would not be consistent with the current plan.

Some aspects of the B2H Project are not consistent with the current management direction in one or more of the relevant land-use plans. For some specific portions of the B2H Project, where avoidance was not possible, or where application of all feasible mitigation measures was determined through project-specific analysis to be insufficient to bring the B2H Project into conformance with the administering federal agency's land-use plan, land-use plan amendments would be required. These plan amendment areas are shown on Maps 3-11a and 3-11b.

The alternative routes would cross BLM-administered lands managed under the Baker Resource Management Plan (RMP) in Oregon (BLM 1989), the Southeastern Oregon RMP (SEORMP) in Oregon (BLM 2002), and the Owyhee RMP in Idaho (BLM 1999). The routes would also cross National Forest System (NFS) lands managed under the Wallowa-Whitman National Forest Land and Resource Management Plan, as amended (LRMP) (USFS 1990). The current management direction for each plan, a description of the plan provisions that would need to be amended and a description of the effects of each proposed amendment are described in this section.

Planning issues and criteria are based on input from BLM, the public, other federal agencies, state government, local government, and Tribal governments. Chapter 1 contains a detailed list of issues identified through public scoping. Below is a subset of issues relevant to the plan amendments.

- What effects will the B2H Project have on conservation and special-designation lands like areas of critical environmental concern or suitable wild and scenic rivers?
- What forest plan and RMP amendments will be needed?
- How would the B2H Project affect designated scenic byways?
- Does the B2H Project conform to existing federal visual resource management objectives?

3.4.1.1 SUMMARY OF CHANGES FROM DRAFT EIS

Section 3.4 was updated to reflect adjustments in the alternative route alignments and variations, the effects of these adjustments on the scope and/or environmental consequences of land-use plan amendments, and to address comments received during public review of the Draft EIS. Land-use plan amendments to authorize the Proposed Action are considered proposed plan amendments in the Final EIS. Ultimately, the BLM and USFS will adopt only those amendments that are necessary for the route selected for construction.

3.4.2 PLAN CONFORMANCE

Aspects of the B2H Project do not conform to current management direction in three of the applicable land-use plans; the BLM Baker RMP, the BLM SEORMP and the USFS Wallowa-Whitman National Forest LRMP. Most of the land-use plan amendments needed to bring the alternative routes into conformance would be limited to specific portions of the 250-feet right-of-way and the boundaries of ancillary facilities. In this case, the planning area boundaries are limited to the proposed 250-feet right-of-way on lands administered by the relevant BLM field office or USFS.

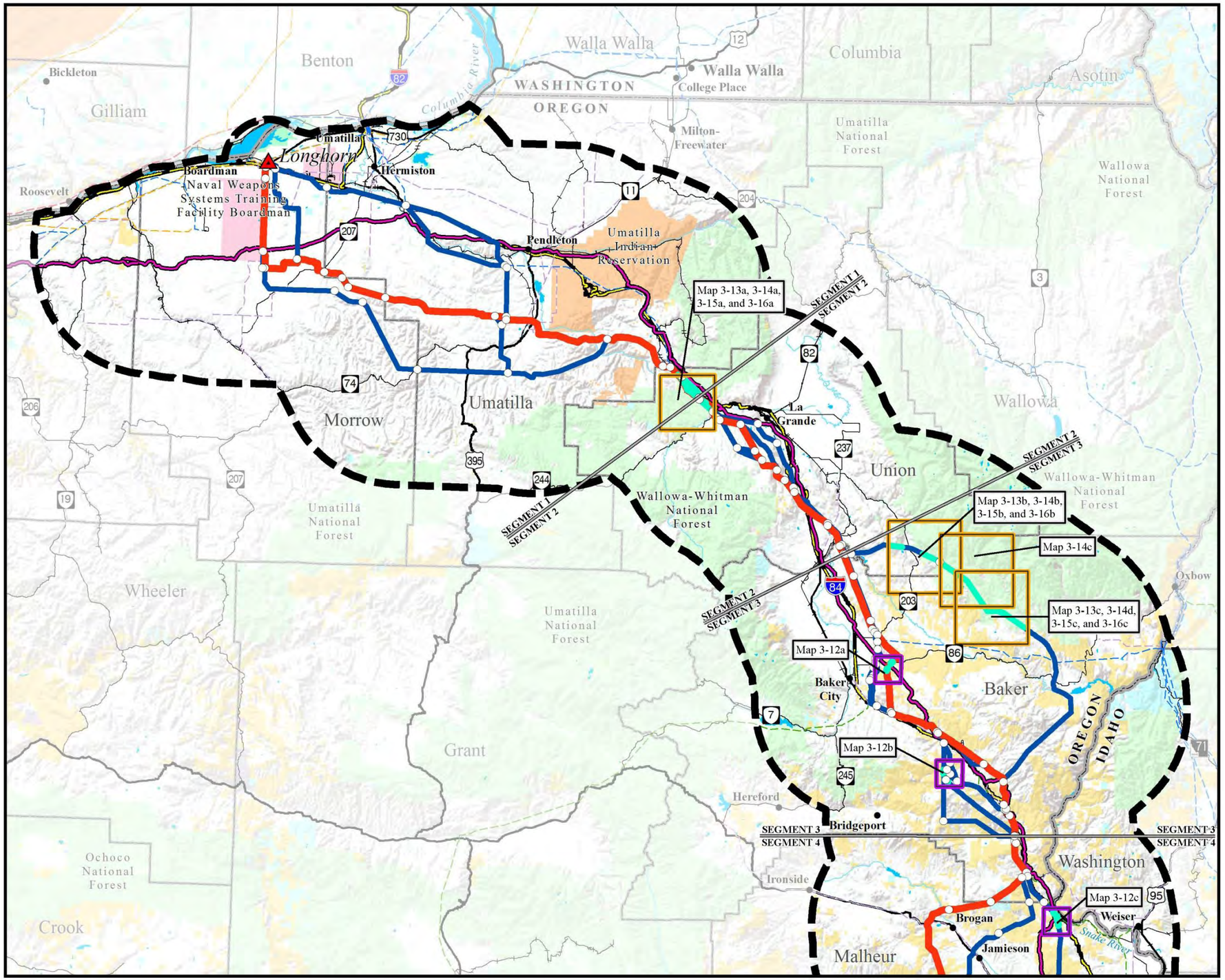
Instances where the B2H Project is not in conformance with applicable land-use plans or objectives include:

- BLM VRM classifications
- USFS VQOs
- USFS Eastside Screens – Interim Wildlife Management
- USFS LRMP direction on PACFISH and INFISH

The proposed land-use plan amendments are identified where alternatives and route variations are not consistent with the BLM and/or USFS land-use plans, and were prepared pursuant to FLPMA, implementing regulations, and the NFMA, as well as both the BLM and USFS land-use planning regulations at 43 CFR 1610 and 36 CFR 219.10 of the planning regulations in effect before November 9, 2000, respectively.

Pursuant to the BLM's planning regulations at 43 CFR 1610.5-2, any person who participated in the plan amendment process for the B2H Project and who has an interest that is or may be adversely affected by the planning decisions proposed by the BLM may protest the approval of the planning decisions within 30 days of the date the EPA's NOA of the Proposed LUP Amendments is published in the *Federal Register*.

The USFS' project-level predecisional administrative review regulations provide for predecisional review of a Final EIS and draft ROD. A 45-day Objection Filing Period will begin when the USFS publishes a legal notice in the newspaper of record, the Baker City Herald, for the B2H Project. If the USFS does not receive objections, the decision can be signed five business days after the end of the 45-day objection filing period. If timely objections to the USFS's draft ROD are received and found to meet all other qualifications, a 45-day review period follows; this review period can be extended by an additional 30 days. By the end of the review period (45 or 75 days), the objection reviewing officer (for the B2H Project, this will be the Regional Forester or his/her designee) must provide a written response to all eligible objections. A decision can be signed once the objection reviewing officer's responses are complete, and any concerns and instructions identified in the response have been addressed by the Wallowa-Whitman National Forest.



Map 3-11a

Proposed Plan Amendments (Northern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Proposed Plan Amendments

- USFS Proposed Plan Amendment Panel
- BLM Proposed Plan Amendment Panel
- Proposed Plan Amendment

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Line

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Other Federal
- State Land
- Private Land

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:950,400 or 1 inch = 15 miles

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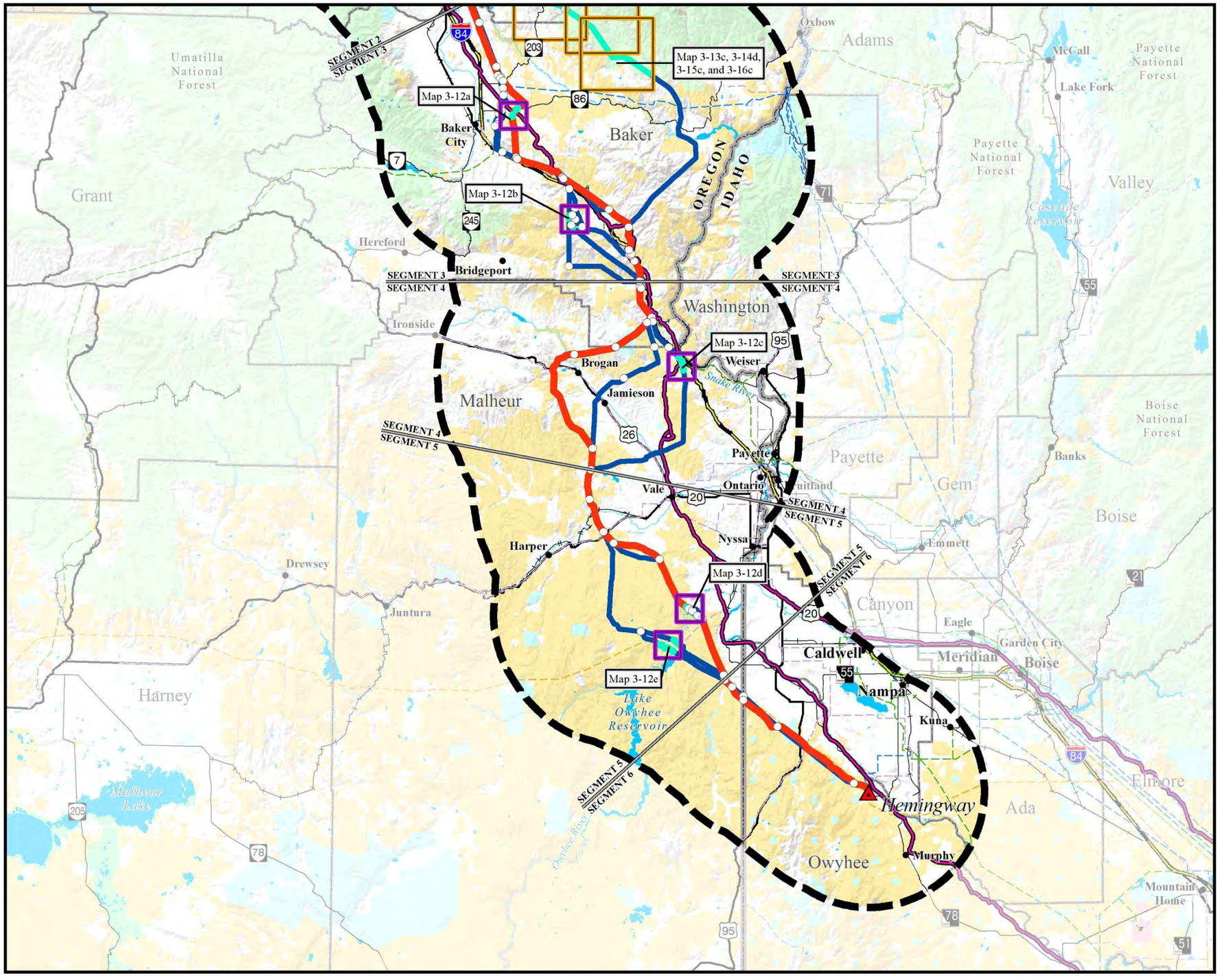

Map 3-11b

Proposed Plan Amendments (Southern Area)

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Proposed Plan Amendments

- USFS Proposed Plan Amendment Panel
- BLM Proposed Plan Amendment Panel
- Proposed Plan Amendment

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Applicant's Proposed Action Alternative
- Alternative Route
- Link Node
- Segment Line

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Other Federal
- State Land
- Private Land

General Reference

- City or Town
- 500-kV Transmission Line
- 345-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Lake or Reservoir
- State Boundary
- County Boundary
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Land Status, BLM 2014, 2015; Cities and Towns, ESRI 2013;
Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Pipelines, ESRI 2012;
Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013;
Waterbodies, ESRI 2013; State and County Boundaries, ESRI 2013;
Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the project.
- Substation symbols do not necessarily represent precise locations.
- The B2H Project area boundary is defined by buffering the alternative route centerlines.
- Other federal land ownership may include lands administered by the U.S. Department of Energy, Bonneville Power Administration, Federal Aviation Administration, General Services Administration, or U.S. Department of Agriculture (except U.S. Forest Service).
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:950,400 or 1 inch = 15 miles

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3.4.2.1 BUREAU OF LAND MANAGEMENT BAKER RESOURCE MANAGEMENT PLAN

The Baker RMP/Record of Decision (BLM 1989) provides direction for managing public lands under the jurisdiction of the Vale District Office within the Baker Field Office. The Baker RMP planning area encompasses approximately 428,425 acres bordered by the Snake River to the east, the southern portion of Asotin County in Washington and the Columbia River to the north, and by Gilliam, Wheeler, Grant, and Malheur counties in Oregon to the west and south. The plan includes provisions to protect or enhance cultural resources, soil, water, botanical resources, visual resources, recreational opportunities, and other resources.

VISUAL RESOURCE MANAGEMENT

Visual resources in the Baker RMP planning area have been classified according to BLM's VRM criteria. These criteria include scenic quality, visual sensitivity, and viewing distance and have resulted in four VRM classifications. Each VRM classification defines management objectives and the degree of visual change that will be acceptable within a landscape.

The Baker RMP includes management direction for VRM Class II, III, and IV lands. These VRM Classes are identified on Map 5 and listed in Table 10 in the Baker RMP. BLM management direction for the VRM classes is:

- Class I - The objective of this classification is to preserve the existing character of the landscape. This class provides for natural ecological changes, and it allows limited management activity. The level of change should be very low and must not attract attention. Class I is assigned to those areas where a management decision has been made to preserve a natural landscape. This includes areas such as wilderness, the wild sections of NWSR's, and other congressionally and administratively designated areas.
- Class II -The objective of this classification is to retain the existing character of the landscape. The level of change to landscape characteristics should be low. Management activities may be seen but should not attract the attention of a casual observer. Any changes must conform to the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. This class represents the minimum level of VRM for WSA's.
- Class III - The objective of Class III is to partially retain the existing character of the landscape. Moderate levels of change are acceptable. Management activities may attract attention but should not dominate the view of a casual observer. Changes should conform to the basic elements of the predominant natural features of the characteristic landscape.
- Class IV - The objective of Class IV is to provide for management activities that require major modification of the landscape. These management activities may dominate the view and become the focus of viewer attention. However, every effort should be made to minimize the impact of these projects by carefully locating activities, minimizing disturbance, and designing the projects to conform to the characteristic landscape.

Purpose and Need to Amend the BLM Baker Resource Management Plan

Because of the visual contrast, the Applicant's Proposed Action Alternative (Variation S3-B1) would not be in conformance with VRM Class III objectives established in the RMP for the area near the NHOTIC near Baker City, Oregon. The 250-foot-wide right-of-way associated with the Applicant's Proposed Action Alternative (Variation S3-B1) would not be in conformance with the BLM VRM Class III objectives in the areas shown in purple on Map 3-12a. The purpose of the RMP amendment would be to modify the Baker RMP regarding visual resource management in order to grant a right-of-way for the Applicant's Proposed Action Alternative (Variation S3-B1) across BLM-administered lands managed under the Baker RMP.

The B2H Project would not be in conformance with the VRM Class II lands crossed by the 250-foot-wide right-of-way associated with the Flagstaff B – Burnt River West (Variation S3-C5) and Flagstaff B – Durkee (Variation S3-C6) alternatives as shown on Map 3-12b. The purpose of the RMP amendment would be to modify the Baker RMP regarding visual resources management in order to grant a right- of-way for the Flagstaff B – Burnt River West (Variation S3-C5) and Flagstaff B – Durkee (Variation S3-C6) alternatives across BLM-administered lands managed under the Baker RMP.

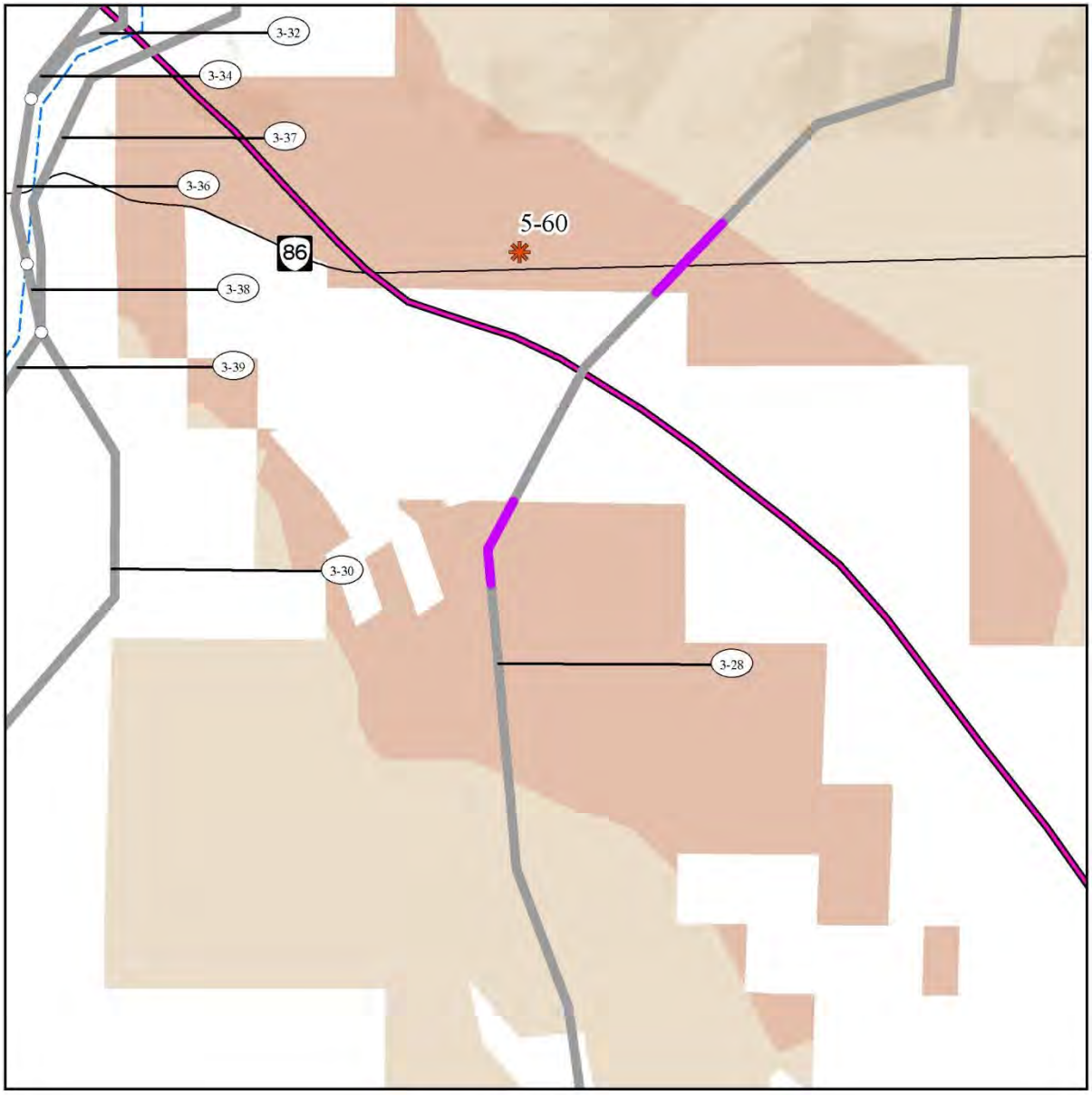
Description of Proposed Plan Amendment

Segment 3

Applicant's Proposed Action Alternative (Variation S3-B1)

In order to authorize the Applicant's Proposed Action Alternative (Variation S3-B1), the Baker RMP would need to be amended in the Visual Resources section beginning on page 49 to add the following language:

> "The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class III lands in the vicinity of the National Historic Oregon Trail Interpretive Center located in portions of:
>
> - Township 9S, Range 41E, Sections 4 and 5 on Link 3-28 between Mileposts 5.7 and 6.1 (approximately 0.4 miles) and
> - Township 9S, Range 41E, Section 8 on Link 3-28 between Mileposts 7.0 and 7.3 (approximately 0.3 miles)
>
> would be amended to VRM Class IV (a total of approximately 20 acres) for only those portions of the B2H Project that would still exceed acceptable levels of change within the VRM Class III areas after application of all feasible measures to reduce impacts on visual resources is exhausted."



Map 3-12a

BLM Plan Amendments

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- BLM Plan Amendment
- KOP with views of area that does not meet BLM VRM Class objectives

Project Features

- Alternative Route
- Link Node

BLM Visual Resource Management (VRM) Classes

- Class I
- Class II
- Class III
- Class IV

General Reference

- 500-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Key Observation Points, Logan Simpson Design 2014; Visual Resource Management, BLM 2009, 2012, 2014; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
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- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:36,000 or 1 inch = 3,000 feet

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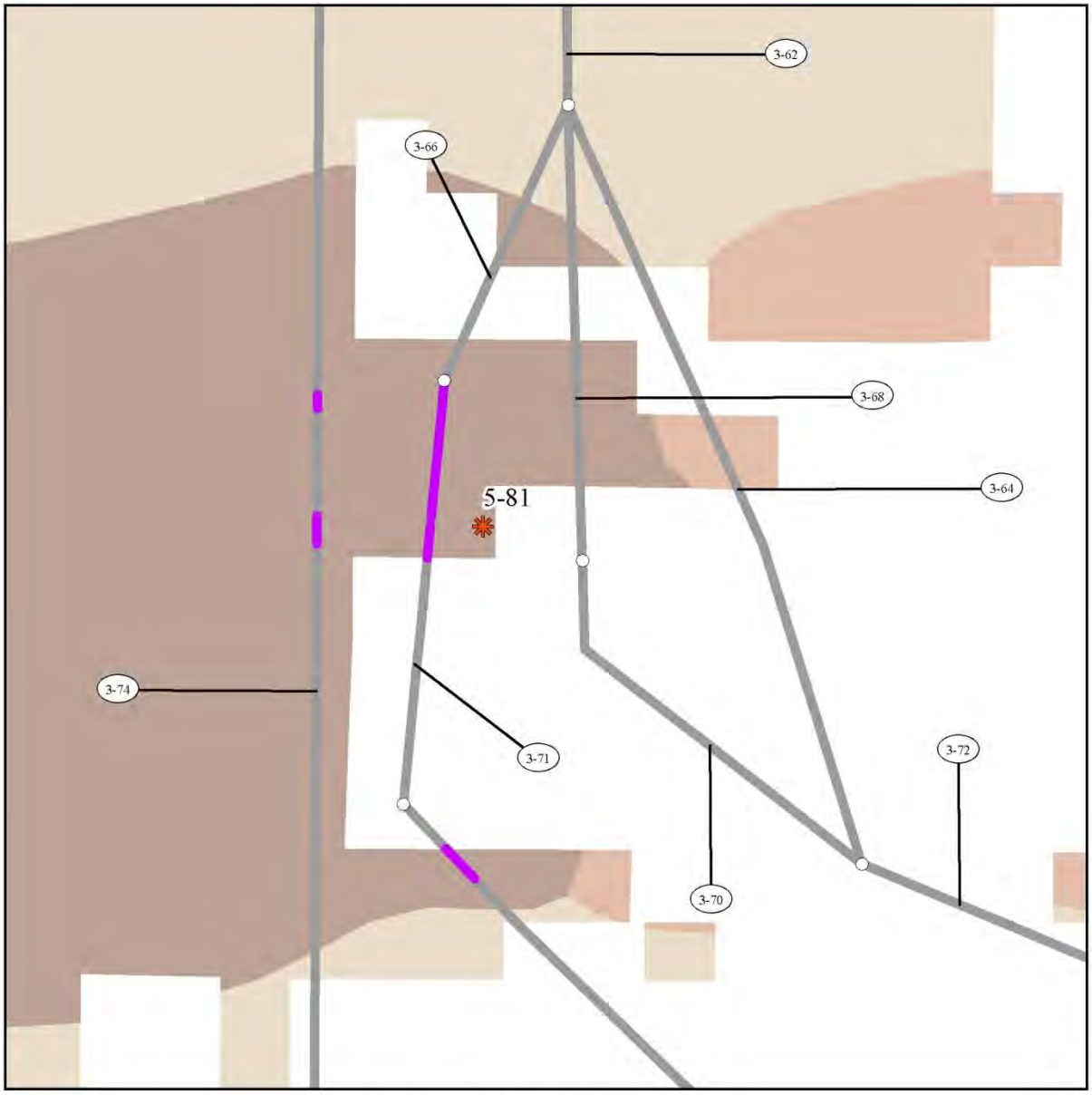

Map 3-12b

BLM Plan Amendments

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- BLM Plan Amendment
- KOP with views of area that does not meet BLM VRM Class objectives

Project Features

- Alternative Route
- Link Node

BLM Visual Resource Management (VRM) Classes

- Class I
- Class II
- Class III
- Class IV

General Reference

- 500-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
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- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Key Observation Points, Logan Simpson Design 2014; Visual Resource Management, BLM 2009, 2012, 2014; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
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- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:36,000 or 1 inch = 3,000 feet

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Flagstaff B – Burnt River West Alternative (Variation S3-C5; Agency Preferred Alternative)

For the Flagstaff B – Burnt River West Alternative (Variation S3-C5), the Baker RMP would need to be amended in the Visual Resources section beginning on page 49 to add the following language:

> "The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class II lands in Burnt River Canyon located in portions of:
>
> - Township 11S, Range 42E, Section 35 on Link 3-71 between Mileposts 0.0 and 0.7 (approximately 0.7 miles) and
> - Township 11S, Range 42E, Section 26 on Link 3-73 between Mileposts 0.3 and 0.4 (approximately 0.1 miles)
>
> would be amended to VRM Class IV (a total of approximately 23 acres) for only those portions of the B2H Project that would still exceed acceptable levels of change within the VRM Class II areas after application of all feasible measures to reduce impacts on visual resources is exhausted."

Flagstaff B – Durkee Alternative (Variation S3-C6)

For the Flagstaff B – Durkee Alternative (Variation S3-C6), the Baker RMP would need to be amended in the Visual Resources section beginning on page 49 to add the following language:

> "The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class II lands in Burnt River Canyon located in portions of:
>
> - Township 11S, Range 42E, Section 27 on Link 3-74 at Mileposts 4.0 and between Mileposts 4.4 and 4.5 (approximately 0.2 miles)
>
> would be amended to VRM Class IV (a total of approximately 5 acres) for only those portions of the B2H Project that would still exceed acceptable levels of change within the VRM Class II areas after application of all feasible measures to reduce impacts on visual resources is exhausted."

Effects

In areas where the visual resources classification is changed from Class II or III to Class IV, an amendment would result in the area being managed at a lower protection level.

Segment 3

Applicant's Proposed Action Alternative (Variation S3-B1)

Amending the land-use plan would result in 20 less acres of VRM Class III and 20 more acres of VRM Class IV (currently there are approximately 276,425 acres of Class III/IV).

The following components of the Visual Resource Inventory (VRI) are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 20 acres of Class B lands; Sensitivity

Level Rating Units: 20 acres of high sensitivity lands; Distance Zones: 20 acres in the Background distance zone; VRI Class: 20 acres of VRI Class II lands.

Amending a portion of the VRM Class designation from VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would allow for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

Flagstaff B – Burnt River West Alternative (Variation S3-C5; Agency Preferred Alternative)

Amending the land-use plan would result in 23 less acres of VRM Class II and 23 more acres of VRM Class IV (currently there are approximately 151,711 acres of Class II and 276,425 acres of Class III/IV).

The following components of the VR) are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 23 acres of Class B lands; Sensitivity Level Rating Units: 23 acres of high sensitivity lands; Distance Zones: 23 acres in the foreground-middleground distance zone; VRI Class: 23 acres of VRI Class II lands.

Amending a portion of the VRM Class designation from VRM Class II to VRM Class IV would allow changes to the characteristic landscape to increase from needing to retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would allow for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

Flagstaff B – Durkee Alternative (Variation S3-C6)

Amending the land-use plan would result in 5 less acres of VRM Class II and 5 more acres of VRM Class IV (currently there are approximately 151,711 acres of Class II and 276,425 acres of Class III/IV).

The following components of the VRI are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 5 acres of Class B lands; Sensitivity Level Rating Units: 5 acres of high sensitivity lands; Distance Zones: 5 acres in the foreground-middleground distance zone; VRI Class: 5 acres of VRI Class II lands.

Amending a portion of the VRM Class designation from VRM Class II to VRM Class IV would allow changes to the characteristic landscape to increase from needing to retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would allow for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

3.4.2.2 BUREAU OF LAND MANAGEMENT SOUTHEASTERN OREGON RESOURCE MANAGEMENT PLAN

The Southeastern Oregon RMP (BLM 2002) provides direction for managing public lands within the Malheur and Jordan field offices of the BLM Vale District. The Southeastern Oregon RMP planning area covers approximately 4.6 million acres of BLM-administered land mainly located in Malheur County, with some lands in Grant and Harney counties. The planning area is bounded on the east by Idaho, on the south by Nevada, on the north by the Vale District's Baker Field Office, and on the west by the BLM Burns District's Three Rivers and Andrews field offices. Most of the public land is contiguous, with some scattered or isolated parcels.

VISUAL RESOURCES MANAGEMENT

Visual resources in the Southeastern Oregon RMP are managed with the same VRM classifications and management direction as described for the Baker RMP. Visual management objectives and management actions in the Southeastern Oregon RMP are as follows:

> "Objective: Manage public land actions and activities in a manner to be consistent with visual resource management (VRM) class objectives.
>
> Management Actions: Public lands within the planning area will be managed as depicted on Map VRM. Table 12 shows VRM classifications. Visual resources in ACEC's will be managed as displayed in Table 13. WSA's, managed in accordance with current policy, will be managed under VRM Class I, subject to any change to current policy. Upon congressional designation of wilderness, any area congressionally released from further wilderness consideration will be managed under VRM Class II, unless inventory shows it to be Class I. Management of the Main, West Little, and North Fork Owyhee NWSR's and administratively suitable study rivers with a tentative wild classification will be managed as VRM Class I. The corridor of the South Fork Indian Creek study river in MRA will be managed as VRM Class II. Manage as VRM Class III, when needed, those administrative sites, recreation sites, and other specific sites requiring developed support facilities to meet public health and safety requirements or to enhance approved resource based recreation use opportunities."

Purpose and Need to Amend the BLM Southeastern Oregon Resource Management Plan

The BLM's land-use planning regulations at 43 CFR 1610.5-5 state, "an amendment shall be initiated by the need to consider a Proposed Action that may result in a change in the scope of resources uses or a change in the terms, conditions, and decisions of the approved plan."

Because of the visual contrast produced by the B2H Project, after the application of appropriate selective mitigation measures the visual effects of the following areas would not be compliant with the Visual Resource Management Class for these areas. The Tub Mountain South Alternative would not be

in conformance with VRM Class III objectives established in the RMP for areas near segments of the National Historic Oregon Trail ACEC – Birch Creek portion (Map 3-12c).

The Applicant's Proposed Action Alternative (Variation S5-B1) would not be in conformance with VRM Class II and III objectives established for the suitable Owyhee River Below the Dam Wild and Scenic River Segment (refer to Map 3-12d). Variation S5-B2 would not be in conformance with VRM Class II objectives established for the suitable Owyhee River Below the Dam Wild and Scenic River Segment

The Malheur A and Malheur S alternatives also would not be in conformance with Class II objectives established for the Owyhee River Below the Dam ACEC and the suitable Owyhee River Below the Dam Wild and Scenic River Segment (refer to Map 3-12e).

More specifically, the 250-foot-wide right-of-way associated with the Applicant's Proposed Action Alternative (Variation S5-B1), Variation S5-B2, Malheur S Alternative, and Malheur A Alternative rights-of-way would not be in conformance with the BLM VRM Class II and III objectives in the areas shown in purple on Maps 3-12d and 3-12e.

The purpose of the RMP amendment would be to modify the Southeastern Oregon RMP regarding visual resources management in order to grant a right-of-way for the Applicant's Proposed Action Alternative (Variation S5-B1), Variation S5-B2, Tub Mountain South Alternative, Malheur S Alternative, or Malheur A Alternative across BLM-administered lands managed under the Southeastern Oregon RMP.

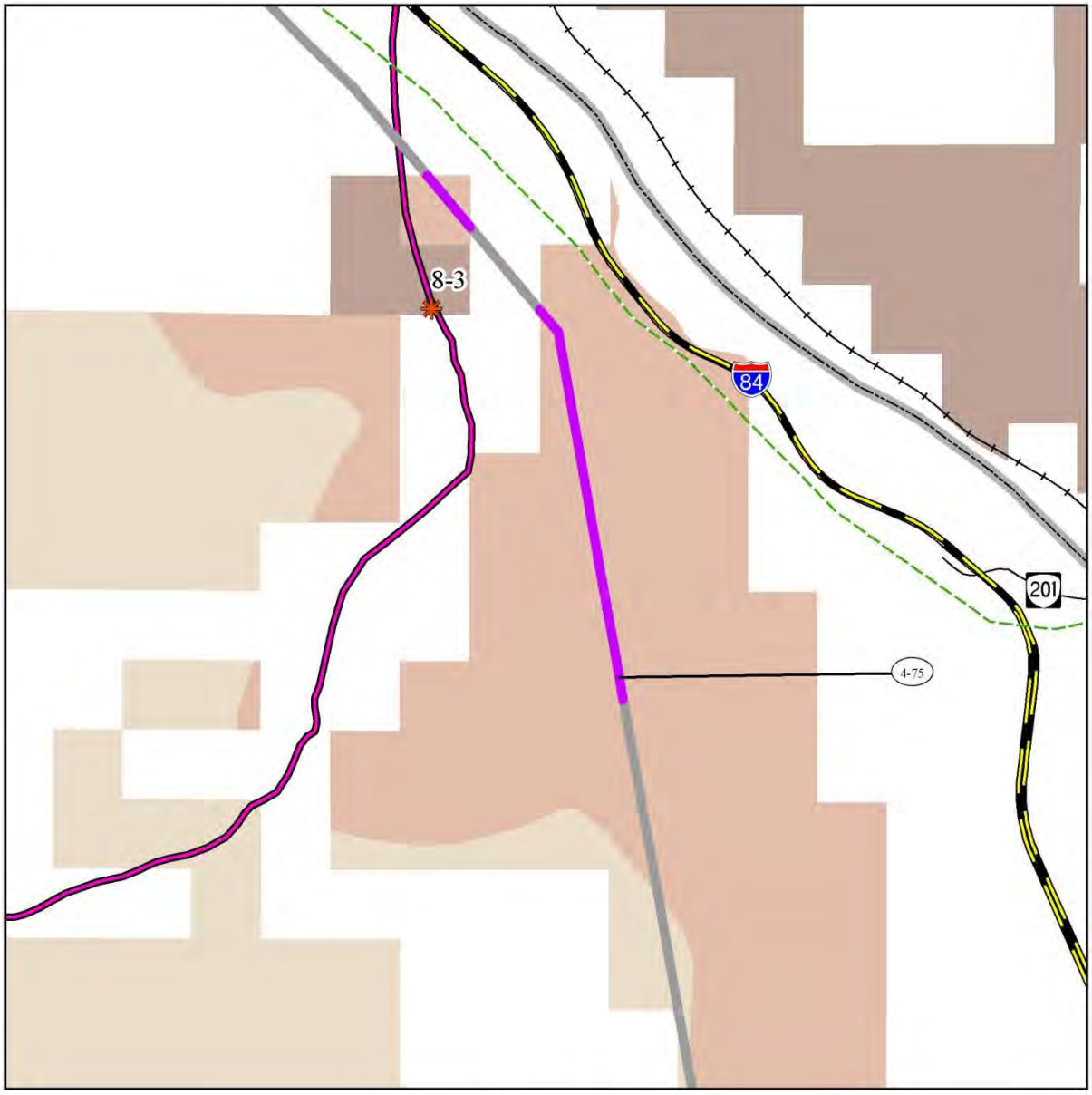
Description of Proposed Plan Amendment(s)

Segment 4

Tub Mountain South Alternative (Agency Preferred Alternative)

For the Tub Mountain South Alternative the Southeastern Oregon RMP would be amended in the Visual Resources section beginning on page 67 to add the following language:

> "The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class III lands in the vicinity, but outside, of the National Historic Oregon Trail ACEC located in portions of:
>
> - Township 15S, Range 45E, Section 9 on Link 4-75 between Mileposts 2.1 and 2.4 (approximately 0.3 miles) and
> - Township 15S, Range 45E, Sections 16, 21, and 22 on Link 4-75 between Mileposts 2.8 and 4.2 (approximately 1.4 miles)
>
> would be amended to VRM Class IV (a total of approximately 51 acres) for only those portions of the Project that would still exceed acceptable levels of change within the VRM Class III areas after application of all feasible measures to reduce impacts on visual resources is exhausted."



Map 3-12c

BLM Plan Amendments

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- BLM Plan Amendment
- KOP with views of area that does not meet BLM VRM Class objectives

Project Features

- Alternative Route
- Link Node

BLM Visual Resource Management (VRM) Classes

- Class I
- Class II
- Class III
- Class IV

General Reference

- 500-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Key Observation Points, Logan Simpson Design 2014; Visual Resource Management, BLM 2009, 2012, 2014; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:36,000 or 1 inch = 3,000 feet

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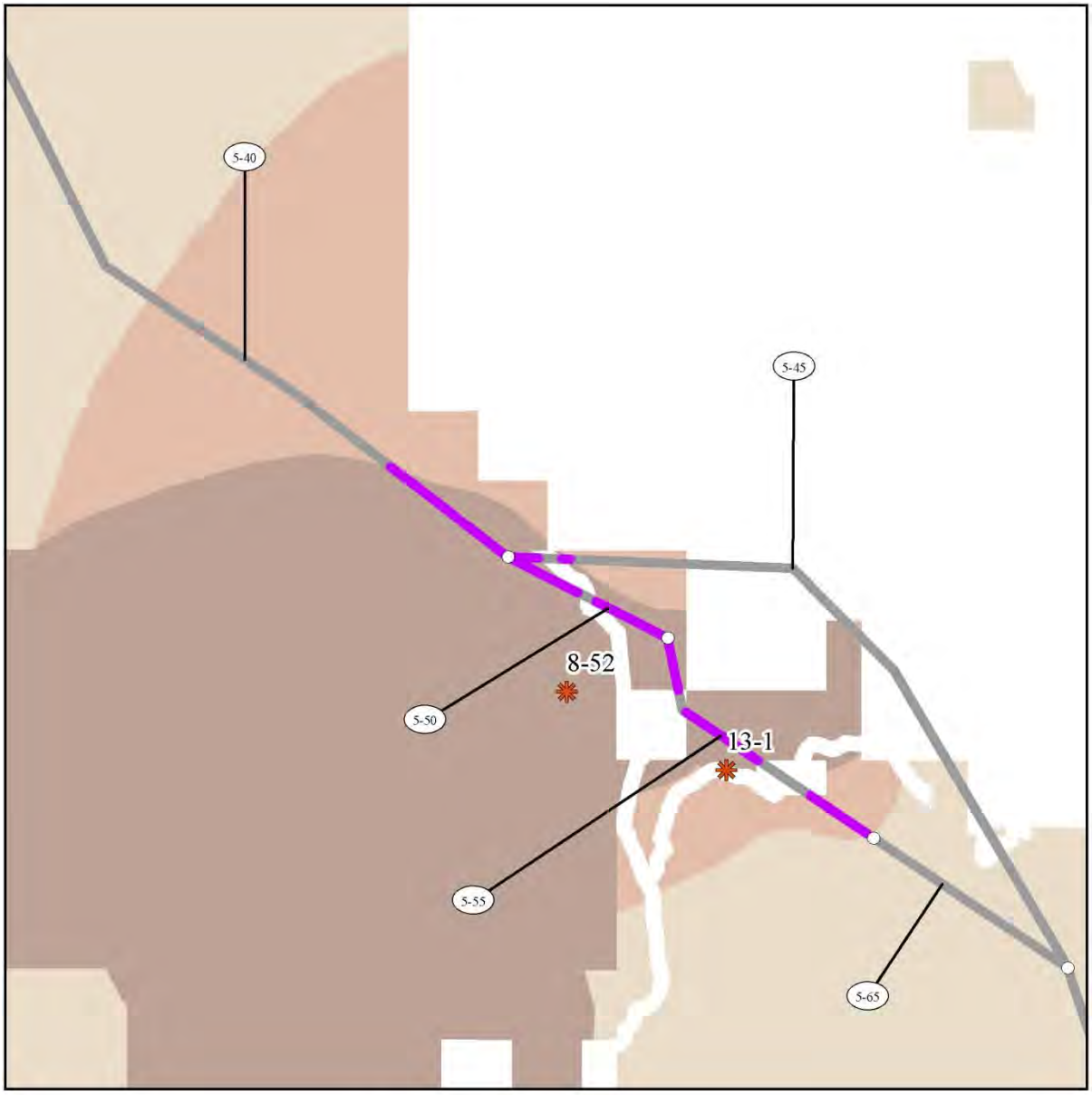

Map 3-12d

BLM Plan Amendments

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- BLM Plan Amendment
- KOP with views of area that does not meet BLM VRM Class objectives

Project Features

- Alternative Route
- Link Node

BLM Visual Resource Management (VRM) Classes

- Class I
- Class II
- Class III
- Class IV

General Reference

- 500-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Key Observation Points, Logan Simpson Design 2014; Visual Resource Management, BLM 2009, 2012, 2014; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:36,000 or 1 inch = 3,000 feet

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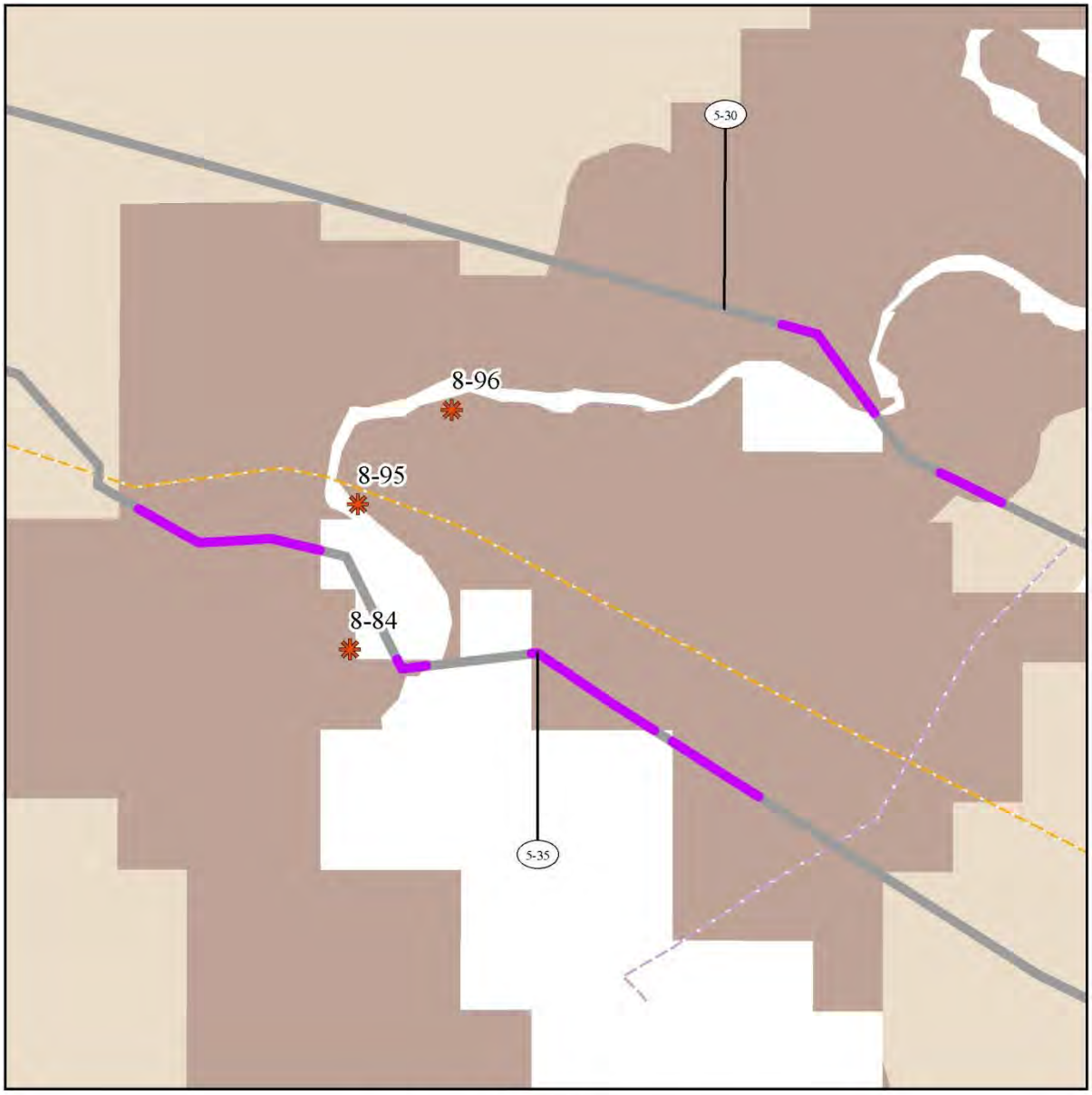

Map 3-12e

BLM Plan Amendments

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- BLM Plan Amendment
- KOP with views of area that does not meet BLM VRM Class objectives

Project Features

- Alternative Route
- Link Node

BLM Visual Resource Management (VRM) Classes

- Class I
- Class II
- Class III
- Class IV

General Reference

- 500-kV Transmission Line
- 230-kV Transmission Line
- 138-kV Transmission Line
- 69- to 115-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Key Observation Points, Logan Simpson Design 2014; Visual Resource Management, BLM 2009, 2012, 2014; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:36,000 or 1 inch = 3,000 feet

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Segment 5

Applicant's Proposed Action Alternative (Variation S5-B1)

For the Applicant's Proposed Action (Variation S5-B1) the Southeastern Oregon RMP would need to be amended in the Visual Resources section beginning on page 67 to add the following language:

> "The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class II and III lands in the Owyhee River Below the Dam ACEC located in portions of:
>
> - Township 21S, Range 45E, Sections 14, 15, 23, and 24 on Link 5-40 between Mileposts 8.1 and 8.6, Link 5-50 between Mileposts 0.1 and 0.6, and Link 5-55 between Mileposts 0.1 and 0.6 as well as between Mileposts 0.9 and 1.1 (approximately 1.8 miles)
>
> would be amended to VRM Class IV (a total of approximately 54 acres) for only those portions of the B2H Project that would still exceed acceptable levels of change within the VRM Class II and III areas after application of all feasible measures to reduce impacts on visual resources is exhausted."

Applicant's Proposed Action Alternative (Variation S5-B2; Agency Preferred Alternative)

For the Variation S5-B2, the Southeastern Oregon RMP would need to be amended in the Visual Resources section beginning on page 67 to add the following language:

> "The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class II lands in the Owyhee River Below the Dam ACEC located in portions of:
>
> - Township 21S, Range 45E, Section 14 on Link 5-45 between Mileposts 0.0 and 0.1 (approximately 0.1 mile)
>
> would be amended to VRM Class IV (a total of approximately 20 acres) for only those portions of the B2H Project that would still exceed acceptable levels of change within the VRM Class II areas after application of all feasible measures to reduce impacts on visual resources is exhausted."

Malheur S Alternative

For the Malheur S Alternative the Southeastern Oregon RMP would need to be amended in the Visual Resources section beginning on page 67 to add the following language:

> "The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class II lands in the Owyhee River Below the Dam ACEC located in portions of:
>
> - Township 22S, Range 45E, Section 9 on Link 5-30 between Mileposts 5.0 and 5.5 as well as between Mileposts 5.8 and 6.1 (approximately 0.7 miles)

would be amended to VRM Class IV (a total of approximately 22 acres) for only those portions of the B2H Project that would still exceed acceptable levels of change within the VRM Class II areas after application of all feasible measures to reduce impacts on visual resources is exhausted."

Malheur A Alternative

For the Malheur A Alternative the Southeastern Oregon RMP would need to be amended in the Visual Resources section beginning on page 67 to add the following language:

"The 250-feet-wide right-of-way for the Boardman to Hemingway Transmission Project within VRM Class II lands in the Owyhee River Below the Dam ACEC located in portions of:

- Township 22S, Range 44E, Section 12 and Township 22S, Range 45E, Section 7 on Link 5-35 between Mileposts 3.4 and 4.1 (approximately 0.7 miles)
- Township 22S, Range 45E, Section 18 on Link 5-35 between Mileposts 4.6 and 4.8 (approximately 0.1 mile)
- Township 22S, Range 45E, Section 17 on Link 5-35 between Mileposts 5.1 and 5.6 from project mileposts 23.5 to 24.0 (approximately 0.5 miles)
- Township 22S, Range 45E, Section 16 and 17 on Link 5-35 between Mileposts 5.7 and 6.1 (approximately 0.4 miles)

would be amended to VRM Class IV (a total of approximately 52 acres) for only those portions of the Project that would still exceed acceptable levels of change within the VRM Class II areas after application of all feasible measures to reduce impacts on visual resources is exhausted."

Effects

In areas where the visual resources classification is changed from Class II or III to Class IV, an amendment would result in the area being managed at a lower protection level.

Segment 4

Tub Mountain South Alternative (Agency Preferred Alternative)

Amending the land-use plan would result in 51 less acres of VRM III (currently 199,078 acres) and 51 more acres of VRM Class IV (currently 1,365,457 acres).

The following components of the VRI are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 51 acres of Class C lands; Sensitivity Level Rating Units: 51 acres of low sensitivity lands; Distance Zones: 45 acres in the foreground-middleground distance zone and 6 acres in the seldom seen distance zone; VRI Class: 51 acres of VRI Class IV lands.

Amending a portion of the VRM Class designation from VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character

to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

Segment 5

Applicant's Proposed Action Alternative (Variation S5-B1)

Amending the land-use plan would result in 46 less acres of VRM II (currently 144,403 acres) and 8 less acres of VRM III (currently 199,078 acres) and 54 more acres of VRM Class IV (currently 1,365,457 acres).

The following components of the VRI are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 54 acres of Class B lands; Sensitivity Level Rating Units: 19 acres of high sensitivity lands and 35 acres of medium sensitivity lands; Distance Zones: 54 acres in the foreground-middleground distance zone; VRI Class: 19 acres of VRI Class II lands and 35 acres of VRI Class III.

Amending a portion of the VRM Class designation from VRM Class II to VRM Class IV would allow changes to the characteristic landscape to increase from needing to retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. Additionally, amending a portion of the VRM Class designation from VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would allow for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

Applicant's Proposed Action Alternative (Variation S5-B2; Agency Preferred Alternative)

Amending the land-use plan would result in 20 less acres of VRM II (currently 144,403 acres) and 20 more acres of VRM Class IV (currently 1,365,457 acres).

The following components of the VRI are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 4 acres of Class B lands; Sensitivity Level Rating Units: 4 acres of high sensitivity lands; Distance Zones: 4 acres in the foreground-middleground distance zone; VRI Class: 4 acres of VRI Class II lands.

Amending a portion of the VRM Class designation from VRM Class II to VRM Class IV would allow changes to the characteristic landscape to increase from needing to retain landscape character to accept instead, major modification of the landscape character. Management activities that under the

existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would allow for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

Malheur S Alternative

Amending the land-use plan would result in 22 fewer acres of VRM II (currently 144,403 acres) and 22 more acres of VRM Class IV (currently 1,365,457 acres).

The following components of the VRI are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 22 acres of Class A lands; Sensitivity Level Rating Units: 22 acres of high sensitivity lands; Distance Zones: 22 acres in the foreground-middleground distance zone; VRI Class: 22 acres of VRI Class II lands.

Amending a portion of the VRM Class designation from VRM Class II to VRM Class IV would allow changes to the characteristic landscape to increase from needing to retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would allow for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

Malheur A Alternative

Amending the land-use plan would result in 52 fewer acres of VRM II (currently 144,403 acres) and 52 more acres of VRM Class IV (currently 1,365,457 acres).

The following components of the VRI are located within the B2H Project plan amendment area boundary: Scenic Quality Rating Units: 34 acres of Class A lands and 18 acres of Class B lands; Sensitivity Level Rating Units: 52 acres of high sensitivity lands; Distance Zones: 52 acres in the foreground-middleground distance zone; VRI Class: 52 acres of VRI Class II lands.

Amending a portion of the VRM Class designation from VRM Class II to VRM Class IV would allow changes to the characteristic landscape to increase from needing to retain landscape character to accept instead, major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would for the B2H Project and the future consideration of co-located projects in the same area without requiring a plan amendment for visual resources.

3.4.2.3 Wallowa-Whitman National Forest Land and Resource Management Plan

The 1990 Wallowa-Whitman National Forest LRMP was prepared, analyzed and approved under the agency's 1982 planning rule. The LRMP provides direction for management of activities by providing goals and objectives and forest-wide standards and guidelines for particular resources and their uses. It

also allocates all acres of NFS lands within the Wallowa-Whitman National Forest to management areas (MA), and provides specific standards and guidelines for each. Since 1990, the LRMP has been amended; the following amendments provide direction applicable to activities proposed for the B2H:

- Regional Forester Amendment #2 – Revised Interim Standards for Timber Sales on Eastside Forests – "Eastside Screens" (1995)
- Regional Forester Amendment #3 – Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California – "PACFISH" (1995)
- Regional Forester Amendment #4 – Inland Native Fish Strategy - Interim Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada – "INFISH" (1995)
- Regional Forester Amendment #5 – Pacific Northwest Region Invasive Plant Program Preventing and Managing Invasive Plants (2005)

Proposed projects and activities must be evaluated for consistency with applicable plan components, following agency planning direction at CFR 219.10(e) of the planning regulations in effect before November 9, 2000. Consistency with applicable forest-wide plan standards and with specific management allocations must be reviewed. The 1990 LRMP generally combines standards and guidelines, which are interpreted to be standards and therefore provide required direction. For the B2H Project, there is a need to amend the plan because the creation of a right-of-way and associated activities cannot be completed without modifying or removing certain standards, as described below. The proposed plan amendments would apply to only the B2H Project and would last for the life of the B2H Project.

For B2H, the evaluation of forest plan consistency and discussion of potentially needed amendments is based on assumptions developed from available information for all alternative routes studied in the Final EIS that cross National Forest System lands. Members of the Wallowa-Whitman National Forest's interdisciplinary team reviewed the applicable B2H Project design features, BMPs, and mitigations, together with the effects analyses presented in the appropriate resource-specific sections of the Final EIS. The team then evaluated consistency with LRMP direction (including the relevant amendments listed above), based on the assumption that the B2H Project design features, BMPs, and mitigation measures would be implemented on NFS lands. It was found that the B2H Project would not be consistent with some MA direction and visual quality objectives, and some direction included in Eastside Screens and PACFISH/INFISH amendments. The proposed plan amendments discussed below were developed to address specific LRMP direction for which proposed activities may not conform. The consistency evaluation is included in the B2H Project record.

A final evaluation of consistency will be made prior to issuance of a special-use authorization for the B2H Project. This evaluation will consider the results of site-specific inventories, final engineering (indicating locations of towers, access roads, facilities, and lands used during construction such as fly-yards, storage areas and fueling areas) and stipulations incorporated in the final POD. If some LRMP

direction will not be met, with exception of the proposed plan amendments described below, various actions could be considered in order for the B2H Project to be consistent with all applicable plan components. This could include adjusting the location of activities through micro-siting to avoid impact, or developing mitigation(s) to eliminate or sufficiently minimize the impact. If consistency with LRMP direction cannot be achieved, USFS may not issue a special use authorization, or supplemental NEPA may be required to approve additional plan amendment(s).

Project-specific amendments are proposed to four general areas of guidance—(1) MA direction, (2) visual quality, (3) Eastside Screens, and (4) PACFISH/INFISH—because conformance with some requirements of these applicable plan components cannot be guaranteed with reasonable avoidances or minimizations. All alternative routes and variations crossing NFS lands would require amendment of at least three of these four areas as outlined in Table 3-822 and discussed in detail in this section.

Table 3-822. Summary of Proposed Amendments to Wallowa-Whitman National Forest Land and Resource Management Plan

Alternative Route	Changed Management Area Direction (Miles Crossed)[1]	Changed Visual Quality Objectives (Miles Crossed)[1]	Exception to Eastside Screens Direction (Miles Crossed)[1]	PACFISH/INFISH (Miles Crossed)
Segment 1				
Applicant's Proposed Action (West of Bombing Range Road)[2]	–	✓ *(4.5)*	✓ *(4.5)*	✓ *(4.5)*
Variation S1-B1	–	✓ *(4.5)*	✓ *(4.5)*	✓ *(4.5)*
Variation S1-B2	–	✓ *(3.7)*	✓ *(3.7)*	✓ *(3.7)*
Segment 2				
Applicant's Proposed Action[2]	–	✓ (1.3)	✓ (1.3)	✓ (1.3)
Variation S2-A1	–	✓ *(1.3)*	✓ *(1.3)*	✓ *(1.3)*
Variation S2-A2	–	✓ *(2.5)*	✓ *(2.5)*	✓ *(2.5)*
Segment 3				
Applicant's Proposed Action[2]	–	–	–	–
Timber Canyon	✓ (19.7)	✓ (17.4)	✓ (19.7)	19.7

Table Notes:
[1]Number of miles of alternative route on USFS-administered lands relevant to proposed plan amendment.
[2]Other alternative routes considered in the segment share the same alignment across the Wallowa-Whitman National Forest.

MANAGEMENT AREA ALLOCATION

The 1990 LRMP allocated lands to 18 MAs. Each MA is described in terms of (1) a description which defines management objectives and specifies resource priorities, (2) direction, and (3) planning assumptions.

All activities proposed on NFS lands in Segments 1 and 2, as part of the Applicant's Proposed Action Alternative and its variations, would occur within MA-17 "Power Transportation Facility Retention" (Table 3-823; refer to Maps 3-13a and 3-13b). The right-of-way for the Applicant's Proposed Action Alternative would cross 4.5 miles of NFS lands and include 128 acres. Access roads would occupy another approximately 30 acres within MA-17. The proposed B2H Project activities are appropriate given this land allocation and would conform with MA-specific management direction outlined in the LRMP (pages 4-56 to 4-60), with the exceptions as described below.

Table 3-823. Wallowa-Whitman National Forest Management Areas Crossed by the Right-of-Way

Alternative Route	Miles of National Forest System Lands Crossed	Management Area (acres)						Total of National Forest System Lands in the Right-of-Way (acres)
		17 – Power Transportation Facility Retention	1 – Timber Production Emphasis	1w – Timber Management-Wildlife Winter Range	3 – Wildlife/Timber	15 – Old-Growth Preservation	16 – Administrative and Recreation Site Retention	
Segment 1								
Applicant's Proposed Action (West of Bombing Range Road)[1]	4.5	128	0	0	0	0	0	128
Variation S1-B1	*4.5*	*128*	*0*	*0*	*0*	*0*	*0*	*128*
Variation S1-B2	*3.7*	*109*	*0*	*0*	*0*	*0*	*0*	*109*
Segment 2								
Applicant's Proposed Action[1]	1.3	40	0	0	0	0	0	40
Variation S2-A1	*1.3*	*40*	*0*	*0*	*0*	*0*	*0*	*40*
Variation S2-A2	*2.5*	*78*	*0*	*0*	*0*	*0*	*0*	*78*
Segment 3								
Applicant's Proposed Action[1]	–	–	–	–	–	–	–	–
Timber Canyon	19.7	0	251	89	247	0	3	590

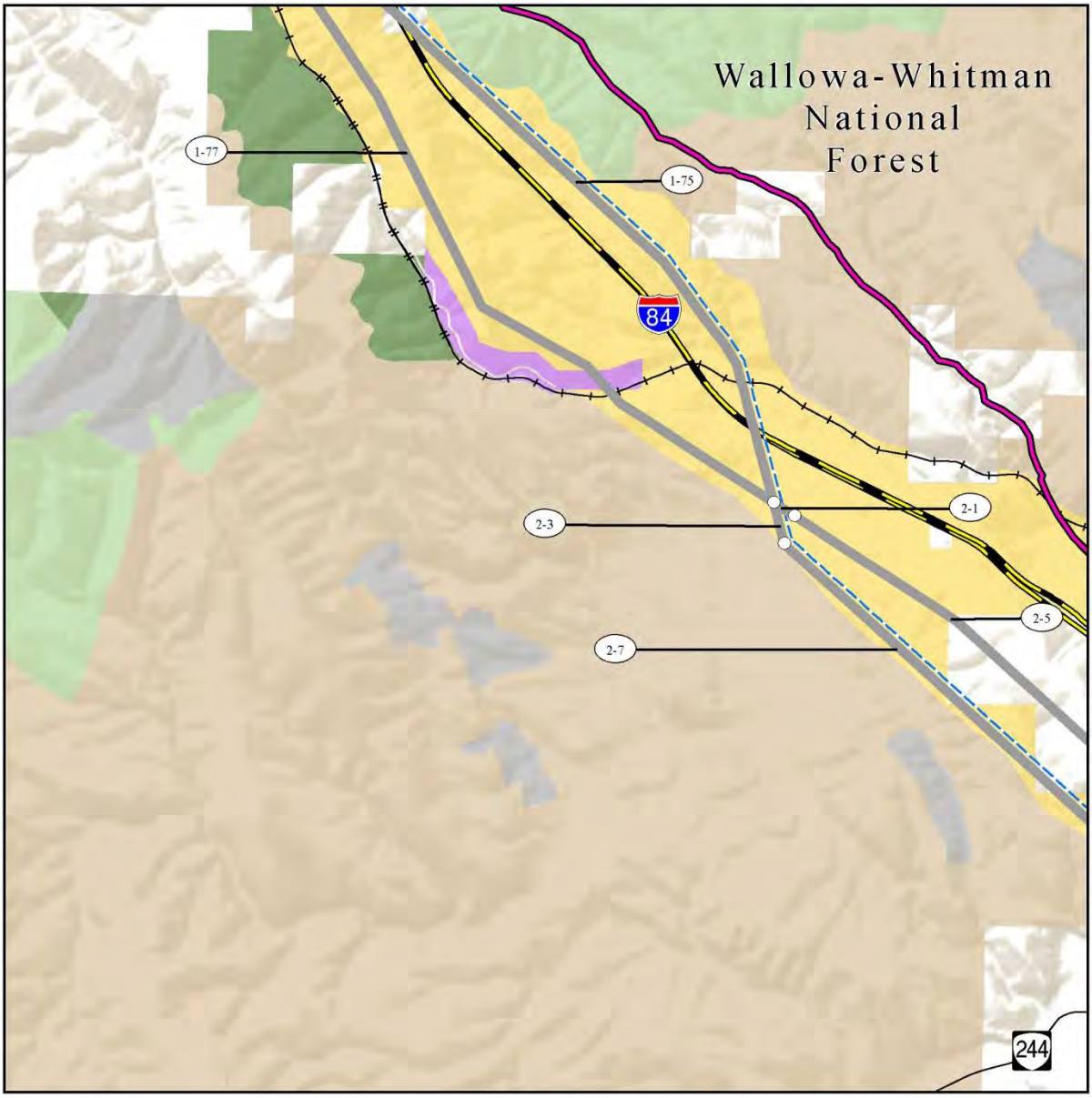
Table Note: [1]Other alternative routes considered in the segment share the same alignment across the Wallowa-Whitman National Forest.

Table 3-824. Estimated Surface Disturbance from Project Access Roads on the Wallowa-Whitman National Forest by Management Area (acres)

Alternative Route	Management Area						Total Surface Disturbance
	17 – Power Transportation Facility Retention	1 – Timber Production Emphasis	1w – Timber Management-Wildlife Winter Range	3 – Wildlife/Timber	15 – Old-Growth Preservation	16 – Administrative and Recreation Site Retention	
Segment 1							
Applicant's Proposed Action (West of Bombing Range Road)[1]	29.6	0	0	0	0	0	29.6
Variation S1-B1	*29.6*	*0*	*0*	*0*	*0*	*0*	*29.6*
Variation S1-B2	*21.9*	*0*	*0*	*0*	*0*	*0*	*21.9*
Segment 2							
Applicant's Proposed Action [1]	6.6	0	0	0	0	0	6.6
Variation S2-A1	*6.6*	*0*	*0*	*0*	*0*	*0*	*6.6*
Variation S2-A2	*11.6*	*0*	*0*	*0*	*0*	*0*	*11.6*
Segment 3							
Applicant's Proposed Action [1]	0	0	0	0	0	0	0
Timber Canyon	0	35	24	69	0	0.5	128.5

Table Note: [1]Other alternative routes considered in the segment share the same alignment across the Wallowa-Whitman National Forest.

In Segment 3, the Timber Canyon Alternative would cross 19.7 miles of the Wallowa-Whitman National Forest, intersecting lands allocated in the LRMP to several different MAs (Table 3-823; refer to Map 3-13c). The 250-feet-wide right-of-way would occupy approximately 590 acres of NFS lands, primarily within MA -1 "Timber Management Emphasis"; MA-3 "Wildlife/Timber"; and MA-1w "Timber Management – wildlife winter range". Access roads would occupy another approximately 129 acres (refer to Table 3-824). A small amount of MA-16 "Administrative and Recreation Site Retention" would be crossed.



Map 3-13a

USFS Plan Amendments: Changed Management Direction

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Management Areas

- 1 - Timber Production Emphasis
- 1W - Timber Production/Winter Range
- 3 - Wildlife/Timber Winter Range
- 16 - Admin and Recreation Sites Retention
- 17 - Power Transportation Facility Retention
- Unassigned
- Other Management Area

General Reference

- 230-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
USFS Land Management Areas, USFS 2015; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:58,000 or 1 inch equals 1 miles

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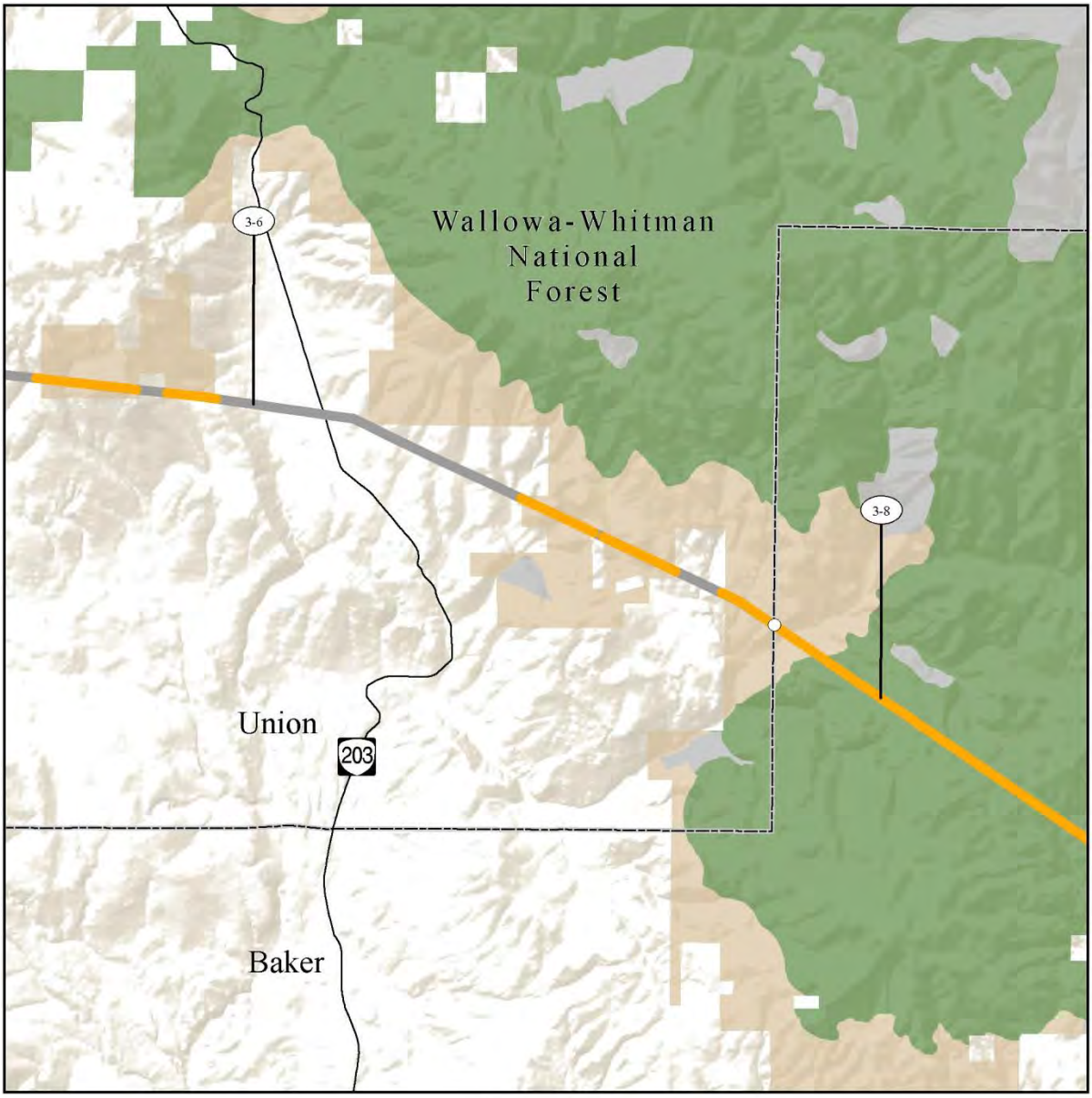

Map 3-13b

USFS Plan Amendments: Changed Management Direction

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Management Areas

- 1 - Timber Production Emphasis
- 1W - Timber Production/Winter Range
- 3 - Wildlife/Timber Winter Range
- 16 - Admin and Recreation Sites Retention
- 17 - Power Transportation Facility Retention
- Unassigned
- Other Management Area

General Reference

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- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
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Final EIS: November 2016

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Miles
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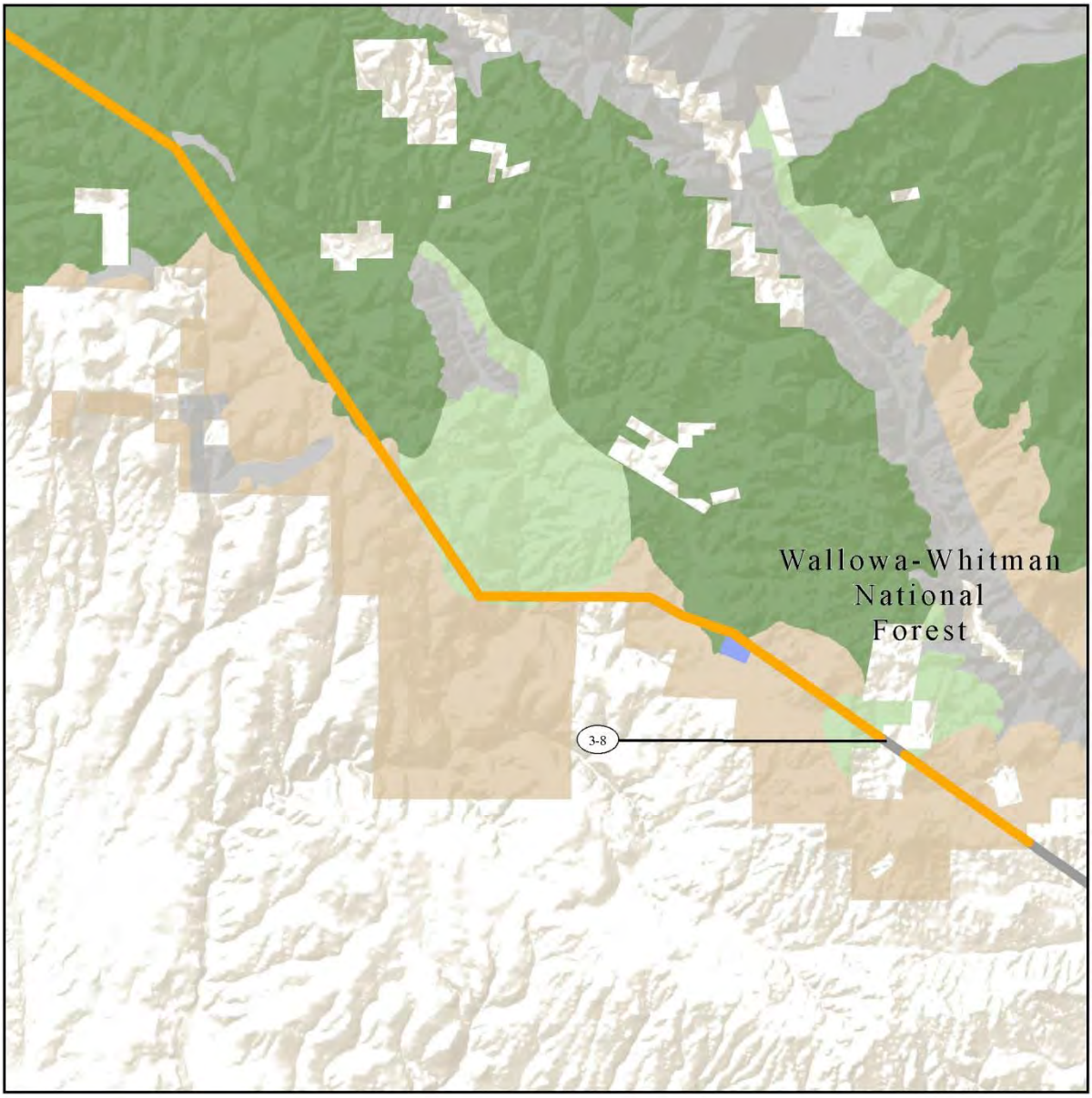

Map 3-13c

USFS Plan Amendments: Changed Management Direction

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Management Areas

- 1 - Timber Production Emphasis
- 1W - Timber Production/Winter Range
- 3 - Wildlife/Timber Winter Range
- 16 - Admin and Recreation Sites Retention
- 17 - Power Transportation Facility Retention
- Unassigned
- Other Management Area

General Reference

- 230-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
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Final EIS: November 2016

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Need for Amendment of Wallowa-Whitman National Forest LRMP

Activities proposed as part of the Timber Canyon Alternative on NFS lands in Segment 3 would occur primarily within MAs 1, 3 and 1w. A small amount (3 acres) MA-16 would also potentially be affected if micro-siting cannot avoid these areas. The proposed activities are not consistent with the description provided in the LRMP for these MAs and would not fully conform with MA-specific direction for any of these allocations, particularly standards related to management of timber and wildlife resources. LRMP direction for MA-17 would be more appropriate than that provided by the current allocations given the activities and use proposed under the B2H Project.

Description of Proposed Plan Amendment

Segment 3

Applicant's Proposed Action Alternative

In Segment 3, the Applicant's Proposed Action Alternative avoids NFS lands. No amendment of LRMP direction is necessary.

Timber Canyon Alternative

For the Timber Canyon Alternative (Link 3-8; refer to Map 3-13b) the Wallowa-Whitman National Forest LRMP would need to be amended to allow management of affected lands as described in Table 3-823 following LRMP direction for MA-17 to facilitate the B2H Project. This project-specific change in management direction would apply to the approximately 590 acres included in the 250-foot-wide right-of-way for the B2H Project. The amendment would also apply to an estimated 129 acres where disturbance, both temporary and permanent, would be needed to provide access. The direction for management of MA-17 would apply to these acres only for the purposes of constructing, operating, and maintaining the B2H Project as follows:

1. Watershed. Apply forest-wide standards and guidelines.
2. Wildlife. Apply forest-wide standards and guidelines.
3. Timber. To the extent practicable, timber management will be planned as on adjacent lands. Timber harvest from suitable timberlands will contribute to the regulated timber harvest.
4. Transportation. Transportation systems will be designed and maintained primarily for the installation and maintenance of the structures associated with the utility corridor although these systems may also serve to access adjacent areas. When not being used for these purposes, these roads will normally be closed. In all cases, roads will be the minimum needed to their intended purposes.
5. Range. Use of this forage within utility rights-of-way will be directed by the applicable allotment management plan.
6. Landscape Management. Manage these areas as described in National Forest Landscape Management, Volume 2, Chapter 2 (USDA Agriculture Handbook 478).
7. Cultural Resources. Protection of the cultural resource values of the Oregon Trail will take priority over use as a utility corridor.
8. Recreation. Provide roaded modified recreation opportunities.

9. Landownership. Consolidate National Forest ownership where this will result in more efficient management or administration.
10. Minerals. Apply forest-wide standards and guidelines.
11. Fire. Tailor slash disposal to meet utility corridor needs.
12. The minimum acceptable suppression response is “contain at all FIS’s.
13. Prescribed fire from unplanned ignition will not be used in this MA.
14. Insects and Diseases. Apply forest-wide standards and guidelines.
15. Other. Manage utilities to create the least impact on National Forest resources. Wherever possible, utility rights-of-way will be designated to allow joint use of the rights-of-way.
16. Additional utility rights-of-way or corridors may be identified and approved subject to site-specific environmental analysis.

Effects

Segment 3

Applicant’s Proposed Action Alternative

In Segment 3, the Applicant’s Proposed Action Alternative avoids NFS lands. No amendment of LRMP direction is necessary.

Timber Canyon Alternative

Changing the management direction for 719 acres (acres within the 250-feet-wide right-of-way and those acres to be disturbed to provide access) from that of the permanent allocation to direction provided in the LRMP for MA-17 would result in application of management standards that are appropriate to power transportation. However, this changed management would result in diminished protections for some resources and uses, such as big game habitat, timber production and old growth habitat. Lands within the B2H Project right-of-way and lands providing access to the B2H Project would not be available for timber production for the life of the B2H Project. Following initial removal of timber from the right-of-way, trees would not be replanted and naturally regenerated trees would not be allowed to grow taller than 12 feet. Vegetation management performed to accommodate the B2H Project would not be designed to consider cover for big game on summer and/or winter ranges. No old growth preservation areas (MA-15) are identified within the proposed right-of-way, but harvest of forested stands would delay development of old-growth stands.

Forest-wide, the area managed under direction for MA-17 (currently 6,594 acres) would be increased by approximately 9 percent for the life of the B2H Project. The current management of forest-wide areas following guidance for MAs 1, 3 and 1w (1.1 million acres combined) would be minimally decreased for this same period.

Cumulative Effects

No amendments to the LRMP have changed the allocation of lands to MA-17. However, several projects have made relatively small changes to other allocations (refer to Table 3-825) and project-specific exceptions to MA guidance. One of these, the Blue Mountain Crossing Oregon Trail

Interpretive Project, is located adjacent to a proposed variation to the Applicant's Proposed Action Alternative in Segment 1 (Variation S1-B2). None are in the vicinity of the Timber Canyon Alternative.

Table 3-825. Previous LRMP Amendments Creating Permanent or One-Time Exceptions to Direction for Management Areas Potentially Impacted by the Timber Canyon Alternative[1]

Project and Amendment Number	Ranger District	Decision Date	Allocation Change Authorized
Blue Mountain Crossing, Oregon Trail Project #2	LaGrande	May 24, 1991	Approx. 70 acres from MA 1 (Timber Production Emphasis) to MA 16 (Administrative and Recreation Site Retention)
Carroll Creek Fire Salvage and Restoration #27b	Wallowa-Valley	May 7, 2001	Re-delineated boundaries of MA-15 and MA-1, with no change in overall acres of either allocation
Horsefly Vegetation Management #38	LaGrande	June 28, 2006	285 acres of MA-3 converted from marginal cover to forage
Muddy Sled Vegetation Management #41	Wallowa Valley	November 3, 2011	13 acres MA-1 and MA-15 changed to MA-16 58 acres of MA-1 changed to MA-15

Table Note: [1]Management Areas 1, 1w, 3, 16 and 17

The total acres of change to the five allocations potentially impacted by the project-specific amendment proposed for the B2H Project (i.e., MAs 1, 1w, 3, 16 and 17), resulting from amendments to the LRMP since it was signed in 1990, is so small that no meaningful cumulative effects could be attributed to these changes at the forest-wide scale. No amendments have changed allocations of lands crossed by or near the Timber Canyon Alternative. Thus, no cumulative effects would be expected at the project scale.

VISUAL RESOURCES MANAGEMENT

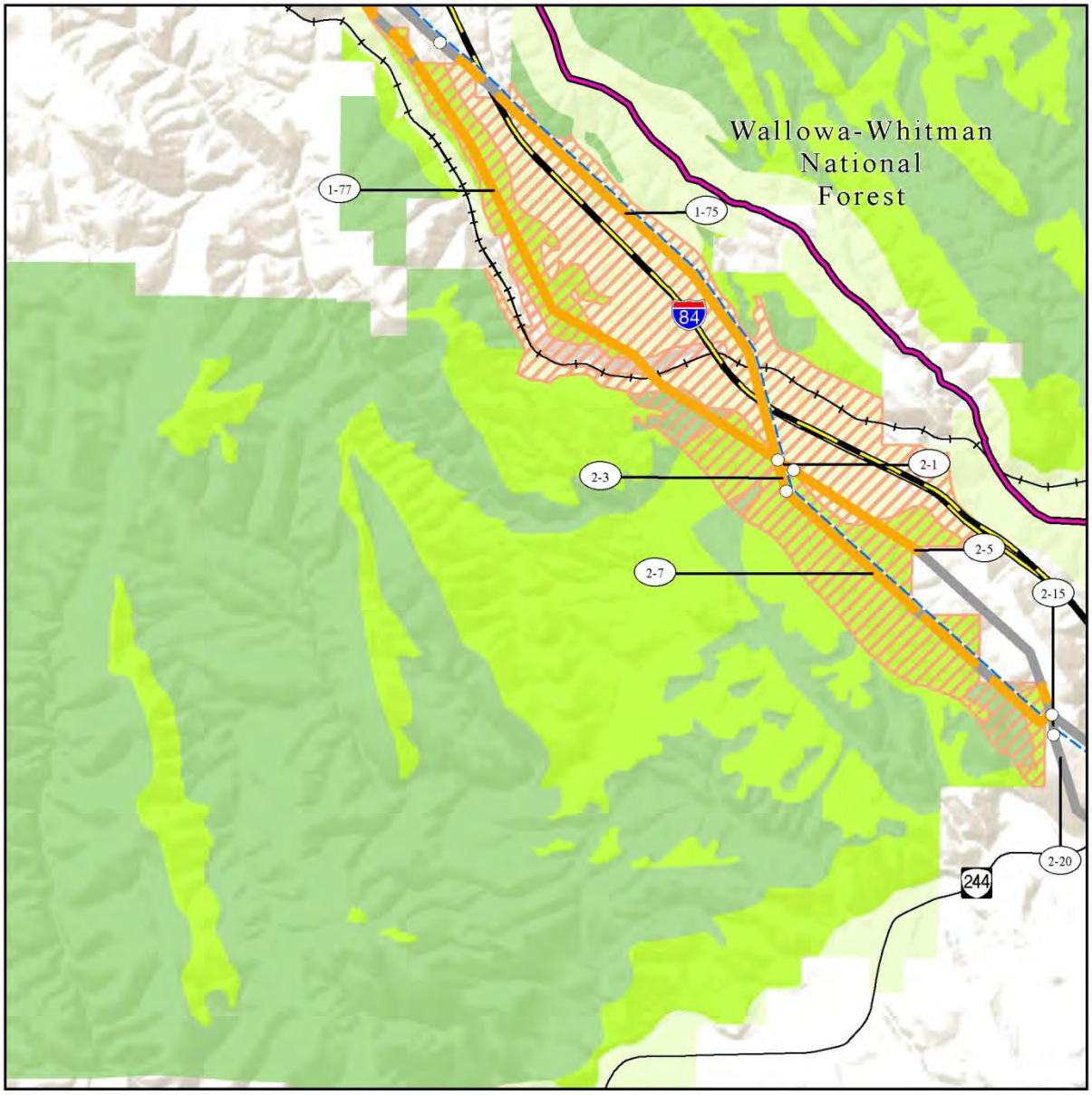
The Wallowa-Whitman National Forest LRMP incorporated USDA Agriculture Handbook 478, which describes VQOs for the management of NFS lands. VQO designations are based on a 1991 visual resource inventory; outcomes of the inventory are reflected in GIS coverages. The VQO designations applied to USFS lands are the following:

- Preservation - allows only natural ecological changes
- Retention - allows management activities which are not visually evident
- Partial Retention - allows management activities which are visually subordinate to the characteristic visual landscape.
- Modification - allows management activities that may visually dominate the original characteristic visual landscape, but when vegetation and land forms are altered, which must use the form, line, color, texture and/or scale of that landscape for its visual characteristics.
- Maximum Modification - allows vegetation and land form altering management activities that dominate the characteristic visual landscape in the foreground and middleground but which have the same visual characteristics as the surrounding area when seen as background.

The VQO designation along the I-84 corridor and within MA-17 is identified as Partial Retention (Table 3-826; refer to Maps 3-14a and 3-14b). The current LRMP direction, with regard to Partial Retention objectives provides:

- Page 4-43: Partial Retention Foreground and Retention Middleground - In partial retention foreground and retention middleground, the area regenerated per decade should not exceed 9 percent or be less than 5 percent of the suitable forest land within any viewshed. The maximum seen area disturbed at any one time should not exceed 14 percent of any viewshed. Limit regeneration unit size to that which meets partial retention and desired character including consideration of future entries and regrowth. The approximate range of sizes to accomplish this is ½ to 2 acres in the immediate foreground (less than 500 feet) and 3 to 5 acres in the foreground greater than 500 feet from the road or trail. Target size tree in foreground is 26 inches where biologically feasible.
- Page 4-44: Partial Retention Middleground - In partial retention middlegrounds, the area regenerated per decade should range between 8 and 10 percent. Limit maximum regeneration unit size to 10 acres. Maximum area disturbed at any one time should not exceed 20 percent.

VQO designations crossed by the Timber Canyon Alternative are most commonly Modification (approximately 13 miles of the route), with smaller amounts of Maximum Modification (approximately 3 miles), Partial Retention (approximately 3 miles) and Retention (less than 1 mile) (Table 3-826; refer to Maps 3-14c and 3-14d).



Map 3-14a

USFS Plan Amendments: Changed Visual Quality Objectives

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment
- Area Modified by Plan Amendment to Maximum Modification Visual Quality Objective

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Visual Quality Objectives (VQO)

- Retention
- Partial Retention
- Modification
- Maximum Modification

General Reference

- 230-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
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Miles
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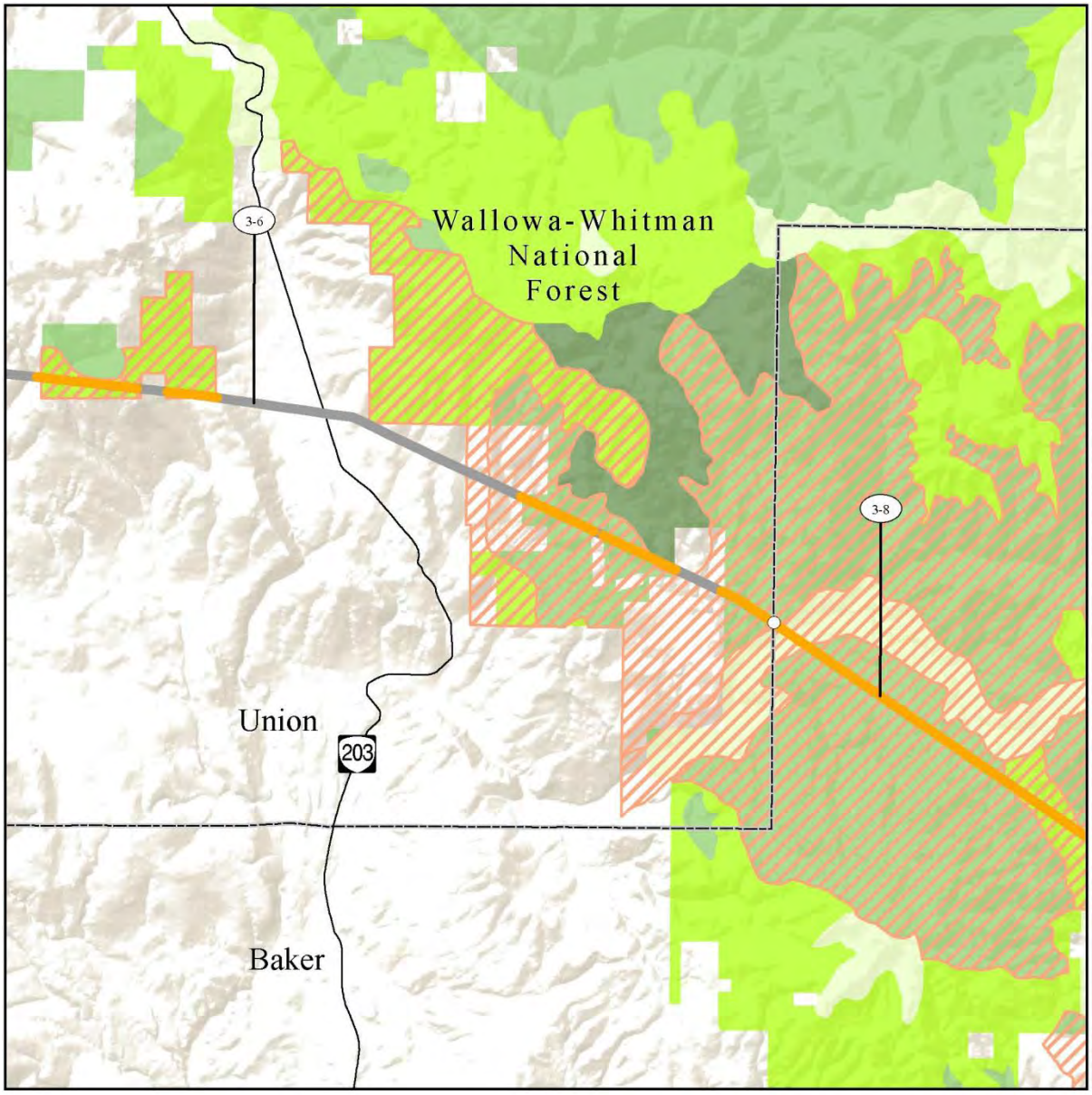

Map 3-14b

USFS Plan Amendments: Changed Visual Quality Objectives

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment
- Area Modified by Plan Amendment to Maximum Modification Visual Quality Objective

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Visual Quality Objectives (VQO)

- Retention
- Partial Retention
- Modification
- Maximum Modification

General Reference

- 230-kV Transmission Line
- Railroad
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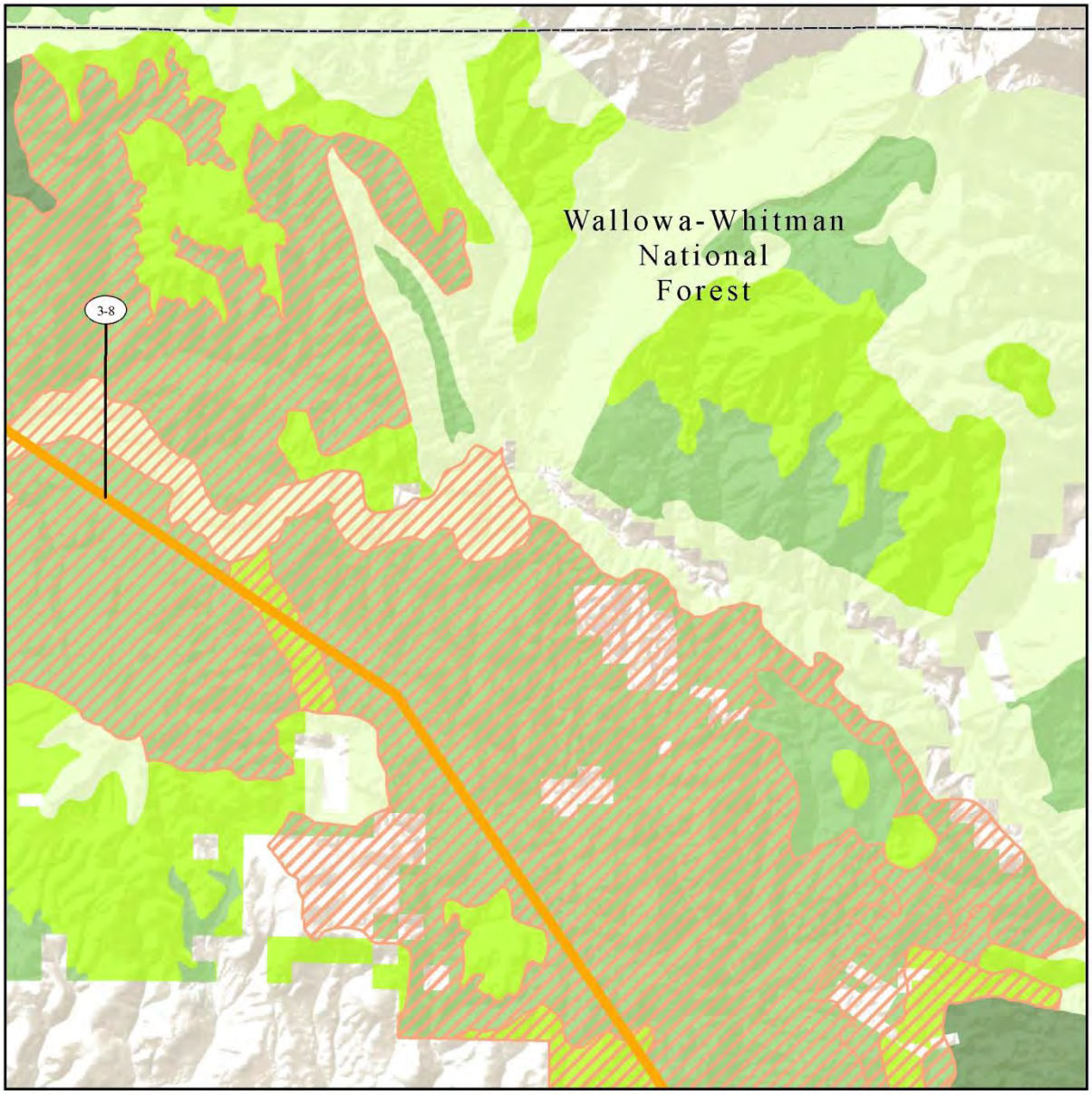

Map 3-14c

USFS Plan Amendments: Changed Visual Quality Objectives

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment
- Area Modified by Plan Amendment to Maximum Modification Visual Quality Objective

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Visual Quality Objectives (VQO)

- Retention
- Partial Retention
- Modification
- Maximum Modification

General Reference

- 230-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
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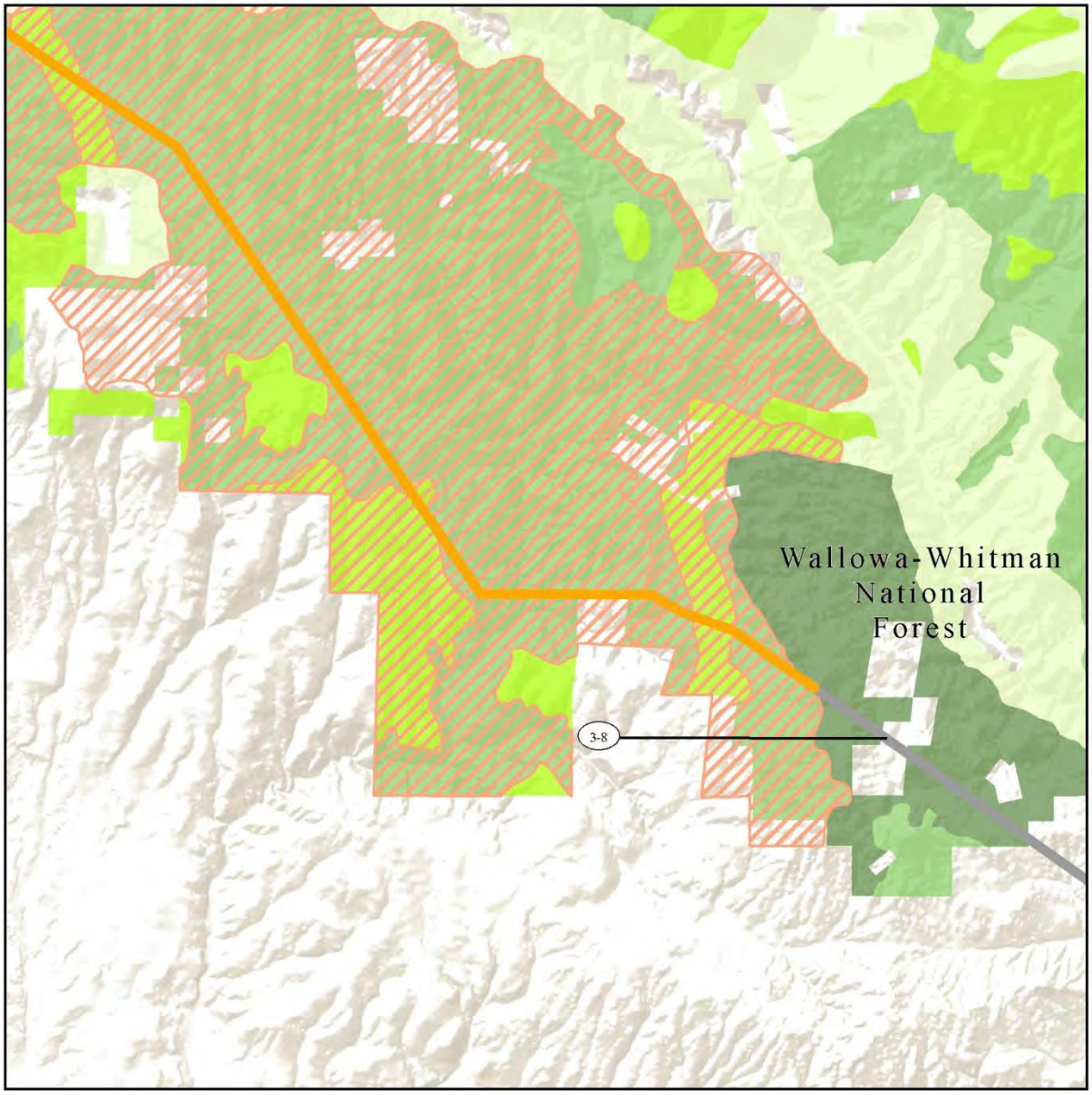

Map 3-14d

USFS Plan Amendments: Changed Visual Quality Objectives

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment
- Area Modified by Plan Amendment to Maximum Modification Visual Quality Objective

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Visual Quality Objectives (VQO)

- Retention
- Partial Retention
- Modification
- Maximum Modification

General Reference

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- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:100,000 or 1 inch equals 2 miles

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Table 3-826. Extent of Proposed Amendments of Wallowa-Whitman National Forest Visual Quality Objectives

Alternative Route	Visual Quality Objectives							
	Existing (miles crossed and acres)[1]				Proposed (miles crossed and acres)[1]			
	Modified	Maximum Modified	Partial Retention	Retention	Modified	Maximum Modified	Partial Retention	Retention
Segment 1								
Applicant's Proposed Action (West of Bombing Range Road)[2]	0.4 (6,163)	0 (0)	3.7 (1,550)	0.4 (2,197)	0 (0)	4.5 (3,010)	0 (0)	0 (0)
Variation S1-B1	*0.4 (6,163)*	*0 (0)*	*3.7 (1,550)*	*0.4 (2,197)*	*0 (0)*	*4.5 (3,010)*	*0 (0)*	*0 (0)*
Variation S1-B2	*0 (0)*	*0 (0)*	*0 (936)*	*3.7 (2,197)*	*0*	*3.7 (2,256)*	*0*	*0*
Segment 2								
Applicant's Proposed Action	0 (0)	0 (0)	0.6 (2,238)	0.7 (2,197)	0	1.3 (3,157)	0	0
Variation S2-A1	*0 (0)*	*0 (0)*	*0.6 (2,238)*	*0.7 (2,197)*	*0*	*1.3 (3,157)*	*0*	*0*
Variation S2-A2	*0.3 (206)*	*(0) (0)*	*2.2 (2,238)*	*0 (2,197)*	*0*	*2.5 (3,278)*	*0*	*0*
Segment 3								
Applicant's Proposed Action	–	–	–	–	–	–	–	–
Timber Canyon	13.3 (35,781)	2.8 (7,769)	3.2 (6,084)	0.4 (2,518)	0	16.9 (52,151)	0	0

Table Notes:
[1]Based on the area within of the LRMP visual quality objective polygons that are intersected by the centerline and/or right-of-way that would be visible from important viewing platforms along major roads.
[2]Other alternative routes considered in the segment share the same alignment across the Wallowa-Whitman National Forest.

Need for Amendment of Wallowa-Whitman National Forest LRMP

Several design features and mitigation measures would be applied to reduce the visual impacts of the B2H Project facilities. However, the size of the area to be disturbed (i.e., cleared of trees) may exceed the maximum specified for foreground (particularly where the transmission line would cross roads) and for middleground in Partial Retention, Retention, and Modification areas. Therefore, the 250-foot-wide right-of-way for the Applicant's Proposed Action Alternative route and variations in Segments 1 and 2 and the Timber Canyon Alternative in Segment 3 would not conform to VQO standards. Access roads and facilities also could contribute to non-conformance with visuals. The amendment would modify the Wallowa-Whitman LRMP regarding visual resource management to allow approval of a special-use authorization for the Applicant's Proposed Action (Variations S1-B1, S1-B2, S2-A1, and S2-A2) and the Timber Canyon Alternative across USFS-administered lands.

Description of Proposed Plan Amendment

For all proposed routes that cross the Wallowa-Whitman National Forest (refer to Table 3-826), VQO polygons intersected by the right-of-way would be reassigned to Maximum Modification for purposes of

constructing and maintaining the B2H Project. This amendment would only apply to the B2H Project activities for the life of the B2H Project. The miles of right-of-way (at the centerline) intersecting four VQO classes and the number of acres of VQO polygons associated with each of the four classes are presented in Table 3-826, for both the existing condition and the proposed amendment.

Effects

Segments 1 and 2

Applicant's Proposed Action (Variations S1-B1, S1-B2 S2-A1, and S2-A2)

Amending the LRMP would result in fewer acres assigned to Modified, Partial Retention, and Retention. Given forest-wide acres of 808,195; 583,054; and 382,157 for these VQOs, respectively, this would represent a very small change for any of these three objective classes. Acres of Maximum Modification in Segments 1 and 2 would increase by approximately 5400 to 6300 acres; depending on the Variation. This VQO class includes the fewest acres (48,021 acres). The proposed change in acres of Maximum Modification would represent a forest-wide increase of approximately 11 to 13 percent.

As described in the Visual Resources section, views from Sensitive Viewing Platforms 4-40 (Spring Creek Campground) and 4-5 (Blue Mountain State Scenic Corridor) would experience a high level of impacts associated with views of the B2H Project as it crosses through heavily forested lands from less than 0.1 mile away. Impacts on Sensitive Viewing Platform 4-33 (Blue Mountain Forest Double Parking Lot) would be partially obstructed by tall evergreen forest vegetation. Where visible from this location, impacts would be moderate because of perpendicular, sky lined views of the B2H Project from a distance of approximately 1.1 miles, as the B2H Project passes through a heavily wooded landscape on a slope that tilts toward the Sensitive Viewing Platform. The view from this vantage point (Blue Mountain Forest Double Parking Lot) would be affected by B2H Project visibility that would be codominant with the scenery of naturally vegetated rolling ridges. The linear feature of the cleared right-of-way and the infrastructure inserted into the landscape draws attention and distracts from the natural landscape, an effect that would last for the life of the B2H Project.

Segment 3

Applicant's Proposed Action Alternative

In Segment 3, the Applicant's Proposed Action Alternative avoids NFS lands. No amendment of LRMP direction is necessary.

Timber Canyon Alternative

Amending the LRMP would result in fewer acres of Modified, Partial Retention, and Retention (currently, forest-wide, these VQOs include 808,195; 583,054; and 382,157 acres, respectively) and approximately 44,400 additional acres of Maximum Modification (currently 48,021 acres forest-wide). This would represent a forest-wide increase of approximately 92 percent for Maximum Modification.

As described in the Visual Resources section there would be no identifiable impacts on views from stationary Sensitive Viewing Platforms or special management areas associated with recreation. There would be high impacts on views from linear viewing platforms associated with recreation. These include

head-on views from crossing the Grande Tour Scenic Bikeway, Grande Tour Route, the Snake River-Mormon Basin Back Country Byway, Powder River Wild and Scenic/Thief Valley Road, and Hells Canyon All American Road. Head-on views of the project infrastructure crossing roads are affected by large towers and cleared right-of-way in the foreground, which would dominate the view. Such large structures combined with such a large clearing would modify the landscape to such a degree that the scenic integrity would be degraded to maximum modification.

Views from Daly Creek, Eagle Creek, Manning Creek Road, Sparta Road, State Highway 203, U.S. Forest Service Road 67-Big Creek, U.S. Forest Service Road 70, and U.S. Forest Service Road 250 would all be highly affected by the B2H Project. Direct overhead crossing would occur to all three U.S. Forest Service Roads through densely forested areas introducing head-on views associated with these travel routes.

A cleared 250-foot-wide right-of-way, greater than 2 acres in the immediate foreground coupled with large infrastructure, would be a dominant visual impact.

The B2H Project would parallel Eagle Creek Road for approximately 3 miles at a distance of approximately 0.5 mile with views of partially skylined transmission line structures from an inferior viewing angle. Sparta Road would be paralleled by the B2H Project at a similar distance; however, it also would be crossed at the southernmost end of the travel route. Both Manning Creek Road and Daly Creek Road also would both be crossed and would have similar views of the B2H Project, including partially skylined views of transmission line structures.

Cumulative Effects

The only potential for cumulative effects of amending for visuals would be from the Blue Mountain Crossing Oregon Trail Project, which changed the visual sensitivity level along 2.9 miles of road and the California Gulch Interpretive Trail to Level 1. Variation S1-B2 would pass through the interpretive area, crossing the section of road identified as Visual Sensitivity Level 1. No other amendments to visual quality objectives have occurred or are proposed in any reasonably foreseeable future projects. The amendments are project-specific and therefore do not affect other activities into the future; thus, cumulative effects would be minimized temporally and spatially. The area of affect is very small compared to the forest as a whole. The effects of the amendment would not provide opportunity in the future to cause undue impacts on scenery resources or impact to a degree that is not consistent to the LRMP.

EASTSIDE SCREENS

In 1995, a Decision Notice for the “Revised Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales” amended nine forest plans in Region 6, including the Wallowa-Whitman National Forest LRMP. This is referred to as Regional Forester’s Amendment #2 (RF-2) and the direction is commonly known as “Eastside Screens.” The direction applies to the design and preparation of all timber sales on eastside forests, except personal use

firewood sales, post and poles sales, sales to protect health and safety, and sales to modify vegetation within recreation special-use areas.

The interim riparian standards in Eastside Screens were replaced by riparian guidance in PACFISH and INFISH. Consistency with PACFISH and INFISH is discussed in the next subsection.

The interim ecosystem standard requires a proposed timber sale and its associated watershed to be characterized for patterns of stand structure by biophysical environment and compared to the Historic Range of Variability (HRV). The difference in percent composition of the structural stages between HRV and current conditions is evaluated. Those combinations of structural conditions and biophysical environments that are outside HRV conditions are considered when determining location of treatments and treatment type, to ensure that late and old structure (LOS) stands do not fall below HRV.

Interim wildlife standards follow two possible scenarios based on the outcome of the HRV analysis within the watershed. In the area of the Wallowa-Whitman National Forest where the B2H Project is proposed, existing stand conditions are representative of Scenario A, as one or both of the LOS stages (single stratum with large trees and multi-stratum with large trees) fall below HRV.

Under Scenario A, there shall be no timber sale harvest activities within LOS stages that are below HRV, and, no net loss of LOS shall occur from that biophysical environment. Outside of LOS, the following must be applied to timber sale activities to maintain and/or enhance LOS components:

- Maintain all structural live trees greater than or equal to 21-inch diameter at breast height (dbh)
- Manipulate structure to move conditions toward HRV
- Maintain open, parklike stands where this occurred historically; encourage the development and maintenance of large diameter, open canopy structure

Additionally, the current level of connectivity between LOS and LRMP-designated old growth stands must be maintained or enhanced, and fragmentation of LOS stands must be reduced.

Under Scenario A, snags, green tree replacements and down logs must be maintained at levels prescribed in Eastside Screens (pieces per acre, diameter, piece length and total lineal length); forest plan standards will be followed when they exceed these prescribed levels. For the Wallowa-Whitman National Forest, the Eastside Screens levels must be followed.

Under Scenario A, every known active and historically used (within the last 5 years) goshawk nest must be protected from disturbance by applying seasonal restrictions; 30 acres of the most suitable nesting habitat surrounding nests will be deferred from harvest; a 400-acre post-fledging area (PFA) will be established around nests by retaining LOS and enhancing younger stands toward LOS, as possible.

Need for Amendment of Wallowa-Whitman National Forest Land and Resource Management Plan

The Wallowa-Whitman National Forest LRMP, including specific direction for MA 17 and the details of LRMP amendment RF-2, indicates that B2H Project-related cutting or destruction of timber would be subject to Eastside Screens direction. Cutting or destruction of timber by the Applicant or any party

working in their behalf necessitates a sale of timber and therefore is subject to the requirements of Eastside Screens. None of the exempted timber sale types apply to the B2H Project. Direction for MA 17 indicates the intent to actively manage timber resources so as to contribute to the regulated timber harvest and to the allowable sale quantity.

Sale of timber associated with clearing and maintaining of the right-of-way for the life of the B2H Project, and as needed to provide for new and widened access roads, would not conform to the wildlife standards of Eastside Screens. Timber sale harvest activities in LOS stands could be necessary, potentially in LOS stages that are below HRV and/or resulting in a net loss of LOS. Sale of trees 21 inches dbh or greater could result from proposed B2H Project activities. Clearing of timber would not allow for manipulating structure to move conditions toward HRV. Open, parklike stands would not be maintained in areas where they historically occurred; development and maintenance of large diameter, open canopy structure would not be encouraged. Current level of connectivity between LOS and LRMP-designated old growth preservation stands (MA-15) might not be maintained or enhanced, and fragmentation of LOS stands would not be reduced. Maintaining snags, green tree replacements and down logs at prescribed levels may not be feasible.

Design features 11 and 13 of the B2H Project for environmental protection would protect active goshawk nests from disturbance, and goshawk nest surveys would be performed prior to final siting. However, it may not be possible to avoid or protect every known historically used goshawk nest. Deferring timber harvest on 30 acres of the most suitable nesting habitat may not be feasible surrounding all nests. Establishment of a 400-acre PFA may not be possible for all nests because retaining LOS and enhancing younger stands toward LOS may not be feasible.

Description of Proposed Plan Amendments

For all alternative routes and route variations crossing NFS lands (refer to Table 3-822), a B2H Project-specific amendment of the Wallowa-Whitman National Forest LRMP direction would be needed. The amendment would apply to the B2H Project-related activities and would remain in place for the life of the B2H Project. Refer to Maps 3-15a through 3-15c.

Interim Ecosystem Standard

LRMP direction (Eastside Screens) would be amended to allow sale of timber associated with the B2H Project to proceed without characterizing patterns of stand structure and comparing to the HRV, as required by the Interim Ecosystem Standards. For purposes of amendment, it will be assumed that guidance for Scenario A applies to the B2H Project area. Conditions in the area are known to represent Scenario A based on HRV analyses performed for previous projects.

Interim Wildlife Standard Scenario A – No Net Loss of LOS

LRMP direction (Eastside Screens) would be amended to allow timber sale activities associated with the B2H Project to occur within LOS stands such that a net loss of LOS may occur.

Interim Wildlife Standard Scenario A – Treatment outside of LOS – Maintain Large Trees

LRMP direction (Eastside Screens) would be amended to allow timber sale activities associated with the B2H Project to remove remnant late and old seral and/or structural live trees with 21 inches dbh or greater.

Interim Wildlife Standards Scenario A – Treatment outside of LOS – Move Structure toward LOS and Maintain Open, Park-Like Stand Conditions

LRMP direction (Eastside Screens) would be amended to allow timber sale activities associated with the B2H Project to manipulate vegetative structures in a manner that would not move it toward LOS conditions. Vegetation management would not be required to encourage the development and maintenance of large diameter, open canopy structure.

Interim Wildlife Standards Scenario A – Maintain connectivity and reduce fragmentation of LOS

LRMP direction (Eastside Screens) would be amended to allow timber sale activities associated with construction and maintenance of the B2H Project to result in a reduction from the current level of connectivity between LOS stands and between all LRMP-designated old-growth habitats, and to increase fragmentation of LOS stands from current levels.

Interim Wildlife Standards Scenario A – Specific prescriptions for Snags, Green Tree Replacements, and Down Logs

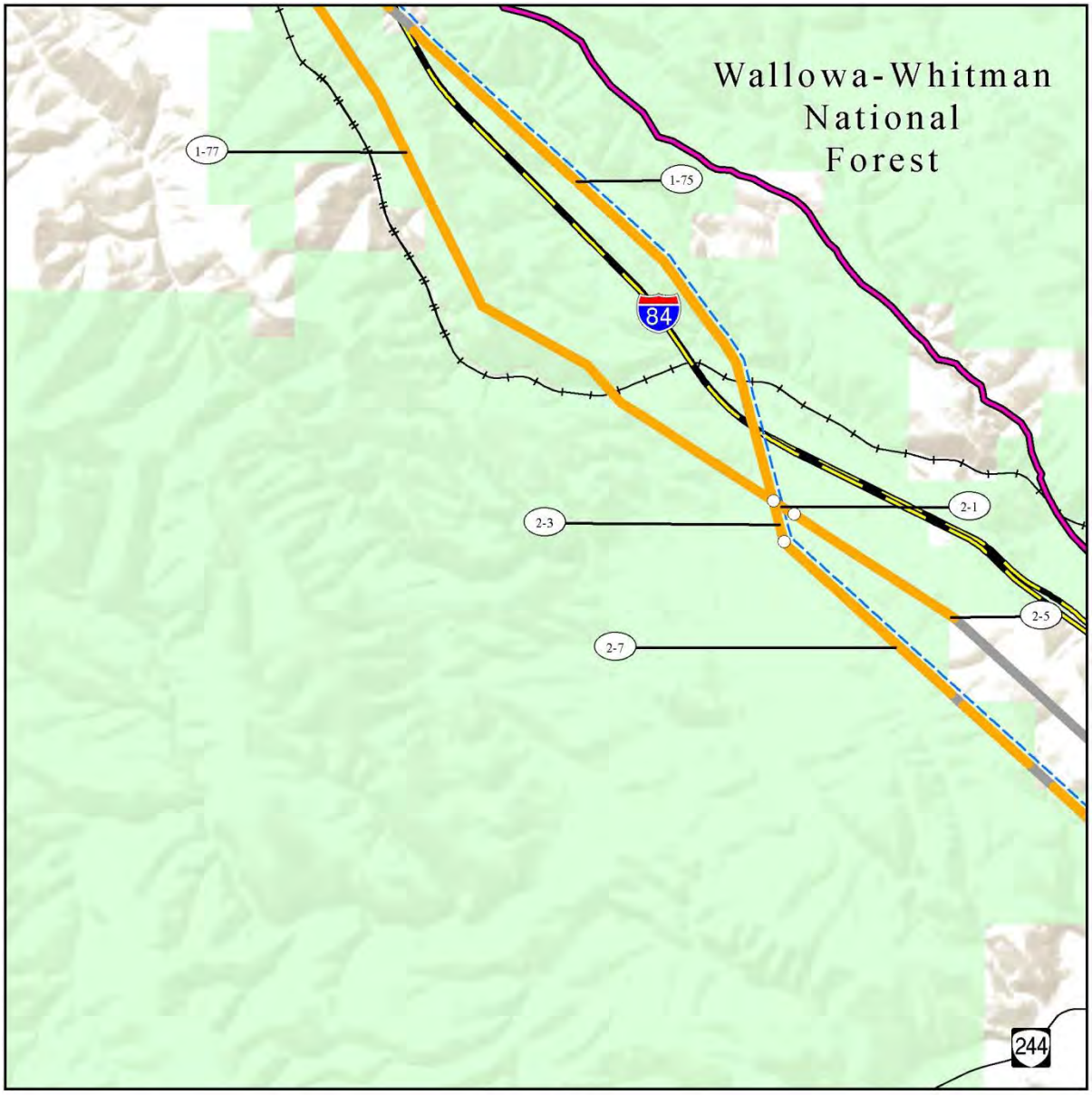
LRMP direction (Eastside Screens) would be amended so that timber sale activities associated with construction of the B2H Project and maintenance of the B2H Project would not be required to adhere to the specific wildlife prescriptions for snags, green tree replacements and down logs.

Interim Wildlife Standards Scenario A – Goshawks

Eastside Screen standards for Scenario A require every known active and historically used goshawk nest-site be protected from disturbance. “Historical” refers to known nesting activity occurring at the site in the last 5 years. Seasonal restrictions on activities near nest sites are required for activity types that may disturb or harass a pair while bonding and nesting. Harvest within 30 acres of the most suitable nesting habitat surrounding all active and historical nest tree(s) must be deferred and a 400-acre PFA must be established around every known active nest site. While harvest activities can occur within the PFA, LOS stands must be retained and younger stands enhanced towards LOS condition, as possible.

Application of Design Features 11 and 13 of the B2H Project would provide protection for active goshawk nests, including seasonal restrictions on activities near active nests.

However, LRMP direction (Eastside Screens) would be amended to allow timber sale activities associated with construction and maintenance of the B2H Project to occur within nesting habitat associated with historical nests, within the 30 acres of the most suitable habitat surrounding all active and historic nest trees, and within PFAs without retaining LOS stands or enhancing younger stands towards LOS.



Map 3-15a

USFS Plan Amendments: Exception to Eastside Screens

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

Proposed USFS Plan Amendment

Project Features

Alternative Route

Link Node

U.S. Forest Service Eastside Screens

U.S. Forest Service Eastside Screens

General Reference

230-kV Transmission Line

Railroad

Interstate Highway

U.S. Highway

State Highway

Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
U.S. Forest Service Eastside Screens, BLM 2014, 2015; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The B2H Project facilities, including temporary access roads, are not fully designed, and the locations of access roads to be used during construction are not known. The approach for estimating ground disturbance associated with upgrading existing access roads or constructing temporary access roads is discussed in Section 2.5.1.1. Estimated ground disturbance was considered in the analysis of proposed plan amendments.
- The plan amendments are proposed for the proposed B2H Project right-of-way.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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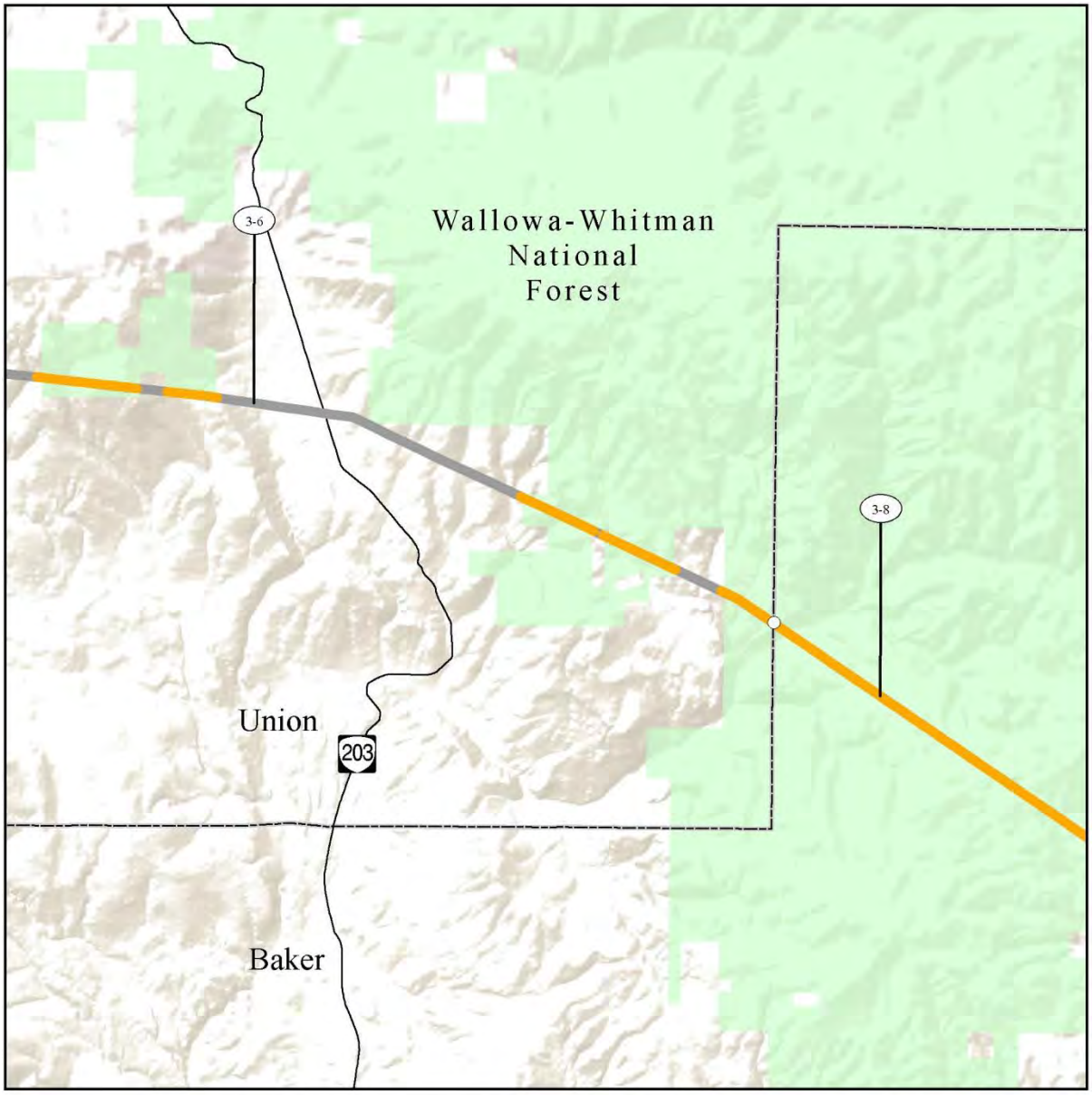

Map 3-15b

USFS Plan Amendments: Exception to Eastside Screens

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

Proposed USFS Plan Amendment

Project Features

Alternative Route

Link Node

U.S. Forest Service Eastside Screens

U.S. Forest Service Eastside Screens

General Reference

230-kV Transmission Line

Railroad

Interstate Highway

U.S. Highway

State Highway

Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
U.S. Forest Service Eastside Screens, BLM 2014, 2015; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The B2H Project facilities, including temporary access roads, are not fully designed, and the locations of access roads to be used during construction are not known. The approach for estimating ground disturbance associated with upgrading existing access roads or constructing temporary access roads is discussed in Section 2.5.1.1. Estimated ground disturbance was considered in the analysis of proposed plan amendments.
- The plan amendments are proposed for the proposed B2H Project right-of-way.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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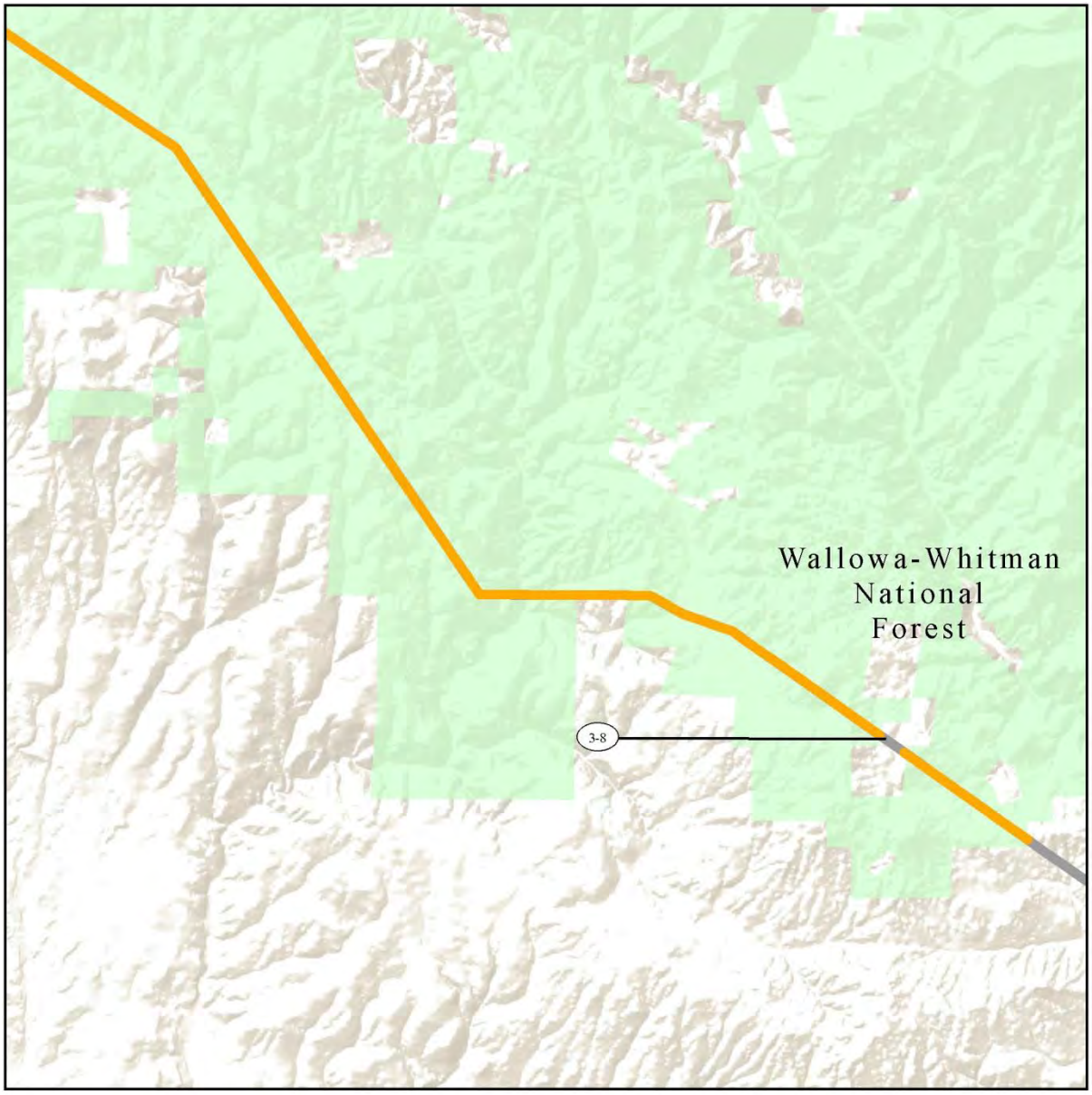

Map 3-15c

USFS Plan Amendments: Exception to Eastside Screens

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

Proposed USFS Plan Amendment

Project Features

Alternative Route

Link Node

U.S. Forest Service Eastside Screens

U.S. Forest Service Eastside Screens

General Reference

230-kV Transmission Line

Railroad

Interstate Highway

U.S. Highway

State Highway

Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
U.S. Forest Service Eastside Screens, BLM 2014, 2015; Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013; Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The B2H Project facilities, including temporary access roads, are not fully designed, and the locations of access roads to be used during construction are not known. The approach for estimating ground disturbance associated with upgrading existing access roads or constructing temporary access roads is discussed in Section 2.5.1.1. Estimated ground disturbance was considered in the analysis of proposed plan amendments.
- The plan amendments are proposed for the proposed B2H Project right-of-way.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:100,000 or 1 inch equals 2 miles

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Effects

All trees within the right-of-way would need to be harvested (i.e. cut or mechanically toppled and removed), with only minor exceptions (e.g. where the line spans a deep watercourse and the transmission line is adequately elevated above the trees so they do not pose a safety hazard to the Project's operations, or in situations where topping of trees may be appropriate). Vegetation within the right-of-way would be maintained at an early seral stage, for the life of the B2H Project, by periodically removing trees over 12 feet in height. Trees would also be removed for construction of new access roads or widening of existing access roads. This would result in reduction of the acres of forested habitat, including LOS where it exists.

Trees 21 inches dbh or greater occur in greatest abundance in LOS stands; however, they can occur in stands of other structural stages as well. There is potential that individual large trees that are outside of LOS stands would need to be removed to accommodate construction of towers (including pulling and tensioning sites), provide access (i.e., by constructing new roads or modifying existing roads), and to provide the required clearance beneath the transmission line.

Removal of individual trees 21 inches dbh or greater from the right-of-way, outside of LOS stands, would delay the development of desired stand structures. Trees naturally regenerating within the right-of-way would not be allowed to exceed 12 feet in height. LOS stand initiation and development would be delayed for the life of the B2H Project. Any existing open, park-like LOS stand conditions would be lost.

Connectivity between LOS stands and allocated old-growth stands would be diminished. Fragmentation of LOS stands would be increased if LOS stands are intersected by the right-of-way or access roads. The number of snags and green tree replacements would be reduced. Existing down wood would be reduced where removal is needed to accommodate construction or management of fuels within the corridor. Sources of future down wood would be eliminated within the right-of-way due to continued removal of trees.

Timber harvest could result in the removal of historic goshawk nests and the nesting, fledging and post-fledging habitat associated with these. Disturbance of active nests would be avoided by seasonal restrictions. Harvest of portions of LOS stands as well as individual trees 21 inches dbh or greater outside of LOS stands could impact wildlife species that are dependent on old-growth conditions. These same species could be further impacted by the reduction of connectivity between LOS stands that would result from clearing within the right-of-way. However, these impacts are expected to be of small enough magnitude that the viability of these LOS dependent species would not be reduced at either the Forest-wide or local scales.

While goshawk nesting activities would be protected from disturbance by design features of the B2H Project for environmental protection providing for seasonal work restrictions around active nests, Project-related timber harvest, including LOS habitat, could result in the loss of historic nests and/or loss of nesting habitat associated with those nests.

Effects on old-growth habitat and to MIS that are dependent on old growth and snag habitats (American marten, northern goshawk, pileated woodpecker and primary cavity excavators; LRMP page 2-9) are discussed in detail in Appendix F, and summarized in the analysis of effects below. These species rely on habitats that Eastside Screens are designed to protect; therefore, evaluating potential impacts of the B2H Project to these species offers context to the effects of amending Eastside Screens.

It is important to note that a conservative approach was used to perform the MIS analyses. A 500-foot study corridor was used as opposed to the 250-foot right-of-way clearing that would actually be created by B2H Project activities. The B2H Project right-of-way could shift based on final design engineering or be microsited to avoid resources issues. Thus, by analyzing a 500-foot study corridor when assessing impacts of the Project to MIS, it takes into account all habitats that could be affected and therefore represents the maximum potential impacts of the B2H Project. In contrast, it is important to note that the amendment descriptions and tables in this section are based on the proposed 250-foot-wide right-of-way for the B2H Project.

Segments 1 and 2

Applicant's Proposed Action Alternative (S1-B1 and S2-A1) and Variations S1-B2 and S2-A2

Table 3-827 displays the estimated extent of sale of timber and loss of LOS stands for the Applicant's Proposed Action and Variations in Segments 1 and 2 (Variations S2-A1 and S2-A2) within the 250-foot-wide right-of-way. Acres of LOS stands impacted could be somewhat higher if the right-of-way centerline were shifted after final Project design. Of the anticipated 155 acres of timber to be removed for the Applicant's Proposed Action Alternative in Segments 1 and 2, less than 1 acre is estimated to be part of a LOS stand. If this stand could be avoided through micro-siting, amendment of this particular standard would not be needed for the Applicant's Proposed Action. Of all the variations in Segments 1 and 2, Variation S2-A2 in Segment 2 has the highest amount of LOS stand removal and would require harvest of 20 acres of LOS stands out of the 311,000 acres of LOS stands Forest-wide. Removal of portions of LOS stands would result in a change in structure stage to stand initiation, and this portion of the stand would remain in an early seral stage for the lifetime of the B2H Project.

Table 3-827. Estimated Area of Sale of Timber and Net Loss of Late and Old Structure Forest within the 250-foot-wide Right-of-Way on the Wallowa-Whitman National Forest (acres)

Alternative Route	Sale of Timber[1, 3]	Loss of Late and Old Structure Stands[2, 3]
Segment 1		
Applicant's Proposed Action (West of Bombing Range Road)[4]	123	0
Variation S1-B1	*123*	*0*
Variation S1-B2	*99*	*0*
Segment 2		
Applicant's Proposed Action[4]	32	<1
Variation S2-A1	*32*	*<1*
Variation S2-A2	*54*	*20*

Table 3-827. Estimated Area of Sale of Timber and Net Loss of Late and Old Structure Forest within the 250-foot-wide Right-of-Way on the Wallowa-Whitman National Forest (acres)

Alternative Route	Sale of Timber[1, 3]	Loss of Late and Old Structure Stands[2, 3]
Segment 3		
Applicant's Proposed Action[4]	–	–
Timber Canyon	557	73

Table Notes:
[1]Acres of forested vegetation types occurring within the 250-foot-wide right-of-way. Based on Forest/Woodland Vegetation type, estimates of timber affected may be overestimated.
[2]Acres of old forest including both single-stratum and multi-stratum within the 250-foot-wide right-of-way.
[3]Acres rounded to nearest acre.
[4]Other alternative routes considered in the segment share the same alignment across the Wallowa-Whitman National Forest.

Project activities associated with the Applicant's Proposed Action Alternative would directly affect a small amount of old growth habitat (1 acre of LOS, and 20 acres for Variation S2-A2), and would occur in dry old forest multi-stratum (OFMS), a structure stage that is adequately represented within the watersheds. It is important to note that the proposed location of the transmission line runs parallel to a major highway and an existing powerline, and the current conditions of the analysis area indicate low LOS habitat connectivity levels. The presence of the B2H Project would continue to fragment and reduce LOS habitat connectivity in this area; however, the effect would be minimal in the context of the current LOS conditions in the watershed.

Loss of LOS, and to a lesser degree the loss of large trees outside of LOS, would have some adverse effects on wildlife species that are dependent on old growth stands and snag habitat. MIS for these habitats include American marten, northern goshawk, pileated woodpecker and primary cavity nesters. Impacts to MIS are evaluated based on changes to source habitat for each species. Source habitat is defined as habitat that can support a stable or increasing population and is specific to individual species. Source habitat may not be confined to a specific structure stage, such as LOS, and it may not include large trees outside of LOS. Therefore, effects to MIS consider all project impacts, not just those resulting from amendment of Eastside Screens, and provide a conservative assessment of effects of amending. Species specific source habitat is defined in Appendix F. Appendix F includes a full description of the analysis for each species.

Habitat for American marten, northern goshawk and pileated woodpecker would be directly impacted, as the B2H Project would remove forested vegetation and maintain the areas in a non-forested condition for the life of the project. However, at the forest wide scale, implementation of the Applicant's Proposed Action Alternative and its Variations would result in source habitats that would continue to contribute to habitat distribution and species viability on the Wallowa-Whitman National Forest. Source habitat for each of these species would be reduced by less than 1/1,000 of 1 percent forest wide.

Habitat for primary cavity excavators would be directly impacted, as B2H Project activities would remove existing snags and eliminate the possibility of future snag recruitment for the life of the B2H

Project. However, due to the linear and limited local impacts of B2H Project activities, snag levels in the area are expected to continue to meet the minimum thresholds across the Forest for these species.

Segment 3

Applicant's Proposed Action Alternative

In Segment 3, the Applicant's Proposed Action Alternative avoids NFS lands. No amendment of LRMP direction is necessary.

Timber Canyon Alternative

Of the estimated 557 acres of timber that would be removed from the right-of-way for the Timber Canyon Alternative, 73 acres are LOS (Table 3-827). Loss of LOS, and to a lesser degree the loss of large trees outside of LOS, would have some adverse effects on wildlife species that are dependent on old growth and snag habitat. MIS for these habitats include American marten, northern goshawk, pileated woodpecker and primary cavity nesters. Impacts to MIS are evaluated based on changes to source habitat for each species. Source habitat is defined as habitat that can support a stable or increasing population and is specific to individual species. Source habitat may not be confined to a specific structure stage, such as LOS, and it may not include large trees outside of LOS. Therefore, effects to MIS consider all project impacts, not just those resulting from amendment of Eastside Screens, and provide a conservative assessment of effects of amending. Species specific source habitat is defined in Appendix F. Appendix F includes a full description of the analysis for each species.

Habitat for American marten, northern goshawk and pileated woodpecker would be directly impacted, as the Timber Canyon Alternative would remove forested vegetation from 557 acres (including 73 acres of LOS) and maintain these areas in a non-forested condition for the life of the project. However, at the forest wide scale, implementation of the Timber Canyon Alternative would result in source habitats that would continue to contribute to habitat distribution and species viability on the Wallowa-Whitman National Forest. Source habitat for each of these species would be reduced by less than 0.5 percent forest wide for American marten and northern goshawk. Little or no source habitat for pileated woodpecker would be impacted.

Project activities would permanently remove any existing snags as well as the possibility of future snag recruitment. However, taking into consideration the size of the project, watershed conditions will not change. Snag levels in the project area will still meet the minimum thresholds for primary cavity excavators and still meet forest plan standards for ecologically appropriate numbers.

Cumulative Effects

In the 21 years the Eastside Screens (Regional Forester's Plan Amendment 2) has been in place, the Wallowa-Whitman National Forest has authorized 11 forest plan amendments to allow harvest in LOS stands below HRV (i.e., to standard #6(d), Scenario A). These amendments have been authorized and harvest completed on approximately 3,269 acres of the 311,730 acres of LOS (old forest) on the forest (Table 3-828), representing about 1 percent of all LOS acres. These treatments did not result in a loss

of LOS, but instead shifted an over-represented structural type of LOS to one that is under-represented across the forest.

Table 3-828. Existing Late and Old Structure Stand (Old Forest) and Historic Range of Variability Stand Structure Conditions on the Wallowa-Whitman National Forest by Vegetation Group

Vegetation Group	Existing Acres		Percent of Total Vegetation Group in Structure		Historic Range of Variability (percent)	
	Old Forest Multi-Stratum	Old Forest Single-Stratum	Old Forest Multi-Stratum	Old Forest Single-Stratum	Old Forest Multi-Stratum	Old Forest Single-Stratum
Cold Upland Forest	120,715	4,690	22	1	10 to 25	5 to 20
Dry Upland Forest	81,565	4,685	7	<1	5 to 15	40 to 60
Moist Upland Forest	98,510	1,565	19	<1	15 to 20	10 to 20
Subtotal	300,790	10,940	--	--	--	--
Total late and old structure	311,730		--		--	

The majority of LOS acres treated were characterized as OFMS structure. OFMS stands occupy approximately 300,790 acres of the Wallowa-Whitman National Forest and are within HRV for all major vegetation groups, while old forest single-stratum (OFSS) stands occupy 10,940 acres and are well below HRV. These amendments have been distributed across the forest, to address needs to restore stands to their historic structure (i.e. to restore OFSS structure), enhance the health of the stands, provide for the habitat needs of old-growth associated wildlife species, in particular those species that rely on OFSS stand structural components, and to reduce fuel loading. In most cases, these projects (e.g. Sugar, Snow Basin, East Face) resulted in no net loss of LOS; rather, only a shift from OFMS to OFSS.

During this same period, the Wallowa-Whitman National Forest has approved three forest plan amendments to Standard #6(d) Scenario A (2)(a) to allow harvest of trees 21 inches dbh or greater (Table 3-829).

Table 3-829. Summary of Projects with Forest Plan Amendments to Regional Forester's Eastside Screens Amendment (RF-2), Standards #6(d), Scenario A and Standards #6(d), Scenario A(2)(a) for Treatment in Late and Old Structure Stand and Removal of Trees Greater than or Equal to 21 Inches Diameter at Breast Height, Respectively

Project and Amendment Number	Ranger District	Decision Date	Amendment Rationale	Scale of Amendment
Amendments Allowing Treatment in Late and Old Structure Stand—Primarily Shifting Old Forest Multi-Stratum Structure to Old Forest Single-Stratum—Resulting in No Net Loss of Late and Old Structure Stand				
Washington Watershed 17	Whitman	February 22, 1995	Promote future old-growth habitat.	466 acres treated
Dry Melon 24	LaGrande	July 14, 1997	Fuel reduction; provide more suitable and sustainable habitat	34 acres treated
Mt. Emily Fuels 32	LaGrande	December 15, 2004	Fuel reduction	110 acres treated
Mt. Emily II Fuels 34	LaGrande	June 28, 2006	Fuel reduction	211 acres treated
Bald Angel Vegetation 35	LaGrande	February 22, 2007	Improve long-term old growth characteristics; return to HRV	629 acres treated
Medical Springs WUI 37	LaGrande	April 22, 2010	Fuel reduction; restore old growth to HRV	501 acres treated
Horsefly 38	LaGrande	August 18, 2008	Fuel reduction; restore old growth to HRV	124 acres treated
Sugar 39	LaGrande	April 9, 2010	Fuel reduction; restore old growth to HRV	370 acres treated
Tremble Aspen 40	Whitman	August 26, 2010	Aspen restoration	41 acres treated
Cove II WUI 42	LaGrande	November 30, 2011	Fuel reduction	340 acres treated
Snow Basin 44	Whitman	March 19, 2012	Species composition shift	346 acres treated
East Face 45	Whitman & LaGrande	February 28, 2016	Fuel reduction	97 acres authorized
			Total late and old structure stand acres treated	Estimated 3,269
Starkey Restoration and Fuels 26	LaGrande	March 20, 2000	Research – dwarf mistletoe	100 trees authorized
Tremble Aspen 40	Whitman	August 26, 2010	Aspen restoration	Estimated 800 trees authorized
Snow Basin 44	Whitman	March 19, 2012	Species composition shift	Estimated 300 trees harvested prior to injunction.
Total trees greater than or equal to 21 inches diameter at breast height harvested				Estimated 1,200

To date, it is estimated that amendments to the Eastside Screen standard prohibiting sale and removal of trees 21 inches dbh or greater have resulted in timber harvest of fewer than 2,000 large trees from timber sales on the Wallowa-Whitman National Forest. Amendments have been distributed across the forest to accomplish a variety of specific purposes including reducing the spread of insects and disease

(primarily mistletoe), aspen restoration, restoring historic tree species composition and improving the survivability of older trees. Recent and reasonably foreseeable future projects have been proposed to shift species composition, protect old ponderosa pine and western larch, and restore unique habitats (e.g., aspen). The effects of removing trees 21 inches dbh or greater in the Starkey Research Project, Tremble Aspen Restoration Project, and Snow Basin Vegetation Management Project (prior to injunction) have likely been more-than-offset with the growth and development of additional large trees over the last 21 years since Eastside Screens were implemented, based on a rate increase of 1.32 over the ten-year period of 1995 to 2005, as indicated by a comparison of Current Vegetation Survey plot data collected during those two years (Personal Communication, M. Rathbone, 2016). This data indicates that the magnitude of increase in the number of trees 21 inches dbh or greater during this period exceeded the number removed under amendments by more than 1,000 times (i.e. an estimated natural increase of 2,000,000 trees 21 inches dbh or greater compared to fewer than 2,000 trees 21 inches dbh or greater authorized to be harvested with timber sales since 1995).

Two planned projects on the Wallowa-Whitman National Forest propose amendments to Eastside Screens to allow cutting and sale of trees 21 inches dbh or greater, and represent reasonably foreseeable future projects. The Lower Joseph Creek Restoration Project proposes harvest of trees 21 inches dbh or greater on 5,000 acres, but limits harvest of large trees to particular situations. The design of prescriptions for cutting of trees 21 inches dbh or greater would be based on the desire to restore forest structure and composition toward reference conditions, or the historical or natural range of variation. Only large trees that are in direct competition with preferred shade-intolerant tree species (ponderosa pine and western larch) would be harvested; no trees greater than150 years old would be harvested. It is anticipated that less than 15 percent of large diameter trees would be removed from treated stands (Draft Record of Decision, page 17). A decision for the Lower Joseph project is expected in the fall of 2016. Even when added to the effects of past amendments and amendments proposed for the B2H Project, the cutting and removal of large trees as part of the Lower Joseph project is expected to be more-than-offset with the growth and development of additional large trees since the Eastside Screens were implemented. Site-specific scenario modeling completed by the Lower Joseph project's interdisciplinary team, and the Wallowa-Whitman National Forest as a whole, concluded that more trees would be lost to fire over a 30-year modeling scenario than would be cut under that proposed action (Draft Lower Joseph Creek Restoration Project Record of Decision, page 17).

The other project proposing amendments to Eastside Screens is the Forest Resiliency Project, which also considers treatments on the Ochoco and Umatilla National Forests. Scoping for that project is complete and alternatives are being developed; release of a draft EIS is expected in 2017. The proposed action, as outlined in the Notice of Intent and scoping documents, identifies treatment areas and types of treatments being considered. However, the site-specific application of the various treatment types is not yet available. Therefore, any estimate of the types of amendments needed, where those amendments would be applied, and what effect they might have would be speculative at this time.

No plan amendments for Eastside Screens have been implemented within or adjacent to the alternative routes that cross National Forest System lands (i.e., within 1 mile either side of proposed right-of-way for the B2H Project). Therefore, no cumulative effects are anticipated at the project-scale.

Portions of the Snow Basin, Medical Springs Wildland Urban Interface (WUI), and Tremble Aspen Projects are adjacent to the Timber Canyon Alternative. Together, these projects resulted in harvest within approximately 1,000 acres of LOS stands, moving them from OFMS to OFSS. This did not change total LOS acres, but instead moved the area toward HRV by increasing the amount of OFSS which is under-represented in the landscape. Tremble Aspen harvested conifers 21 inches dbh or greater within aspen stands, to reduce competition from conifers and improve vigor of aspens. Snow Basin harvested approximately 300 trees 21 inches dbh or greater while preserving all trees older than 150 years.

Implementation of the Timber Canyon Alternative could result in minor cumulative effects on old-growth and habitat for old growth-dependent species at the B2H Project scale. It is possible that direct and indirect effects of the Timber Canyon alternative (summarized in this section and discussed in the MIS analysis in Appendix F), when added to any residual effects from implementation of Cove II WUI Fuels and Snow Basin Vegetation Management projects, could result in cumulative effects, most likely related to reduction in quality and quantity of connectivity. Tremble Aspen Restoration Project would not likely have additive effects, given that the project harvested only scattered large trees.

No amendments to the LRMP have authorized exceptions to any Eastside Screens standards besides the two discussed above (i.e. harvest in LOS and harvest of ≥21” dbh trees). Therefore, there is no potential for cumulative effects to result from amending the other requirements of Eastside Screens (i.e. moving stand structure toward LOS, providing for connectivity, reducing fragmentation, providing specified levels of snags, green tree replacements, and downed logs, and protecting goshawk habitat), at either the forest-wide or a project-scale.

PACFISH AND INFISH

In 1995, a Decision Notice for the “Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California” amended 15 forest plans in Region 6, including the LRMP for the Wallowa-Whitman National Forest. This is referred to as Regional Forester’s Amendment #3 (RF-3), and the direction is commonly known as “PACFISH.” The direction provides a strategy for management of anadromous fish-producing watersheds on NFS lands as well as lands managed by the BLM. The management measures are to be applied to proposed or new projects and activities, to mitigate the effects of these decisions to anadromous fish and their habitat. Another Decision Notice signed the same year, “Inland Native Fish Strategy - Interim Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada”, amended 22 forest plans, including the Wallowa-Whitman National Forest LRMP. Regional Forester’s Amendment #4 (RF-4), known as “INFISH”, is intended to “maintain options for inland native fish by reducing the risk of loss of populations and reducing potential negative impacts on aquatic habitat.”

The direction provided in PACFISH and INFISH is similar; however, they apply in different watersheds. PACFISH applies in all watersheds producing anadromous fish while INFISH applies in all other native fish-producing watersheds. The Applicant's Proposed Action Alternative and its variations lie largely within the Grande Ronde drainage, which provides habitat for anadromous fish and is identified as a key watershed covered by PACFISH. The Timber Canyon Alternative is outside of the boundaries identified for PACFISH; however, INFISH direction is applicable because streams in the watersheds crossed by this route support populations of native fish. Because the direction in these two strategies is similar, the discussion below addresses them together and refers to the guidance as "PACFISH/INFISH."

PACFISH/INFISH establishes goals to maintain or restore fish habitat, along with riparian management objectives (RMOs) that describe good habitat for anadromous and native fish relative to seven habitat features: pool frequency, water temperature, large woody debris, substrate sediment, bank stability, lower bank angle and width/depth ratio. PACFISH/INFISH direction also defines four categories of Riparian Habitat Conservation Areas (referred to this EIS as RCAs) with widths ranging from 100 to 600 feet, and provides project and site-specific standards that apply to all RCAs. Standards are designed to ensure management activities do not retard or prevent attainment of RMOs. Standards for timber management, roads management, and general riparian area management, as well as some standards for lands and fire/fuels management, would apply to activities associated with the B2H Project. Other standards could apply to compensatory mitigation actions, such as those for fisheries and wildlife restoration.

Need for Amendment of Wallowa-Whitman National Forest Land and Resource Management Plan

Implementation of design features of the B2H project for environmental protection and selective mitigation measures would ensure that B2H Project activities are consistent with applicable standards for roads management, general riparian area management, and fires/fuels. However, felling of trees within RCAs associated with clearing and maintaining of the right-of-way for the life of the B2H Project, and as needed to provide for new and widened access roads, would not conform to timber management standards which prohibit timber harvest in RCAs. Also, removal of trees and other vegetation within RCAs could result in decreased shading of streams. Reduced shading could result in slightly increased stream water temperatures in habitat for anadromous fish (including designated critical habitat for ESA listed species) and habitat for other native fish in streams. This could retard attainment of RMOs for water temperature under both INFISH and PACFISH, due to the need to maintain this reduced stream shading for the life of the B2H Project. Implementation of design features of the B2H project for environmental protection and selective mitigation measures related to construction of stream crossings, road locations within riparian areas, and placement of large woody debris in the channel and on floodplains are expected to result in conformance with RMOs for pool frequency, large woody debris, bank stability, lower bank angle and width/depth ratios.

Description of Potential Plan Amendments

For all alternatives and variations crossing NFS lands (i.e., the Applicant's Proposed Action Alternative, its variations, and the Timber Canyon Alternative), a B2H Project-specific amendment of the Wallowa-Whitman National Forest LRMP direction (amendments RF-3 and RF-4, PACFISH and INFISH) would be needed. The amendment would apply to B2H Project-related activities and would remain in place for the life of the project. The potential area to which this amendment would apply includes the right-of-way areas within RCAs, displayed in Table 3-830, and would range from 15 acres of right-of-way in RCAs for the Applicant's Proposed Action Alternative (in Segments 1 and 2) to 97 acres for the Timber Canyon Alternative (Segment 3). Refer to Maps 3-16a through 3-16c.

The amendment to PACFISH/INFISH also would apply to the construction, upgrading and maintenance of access roads located within RCAs.

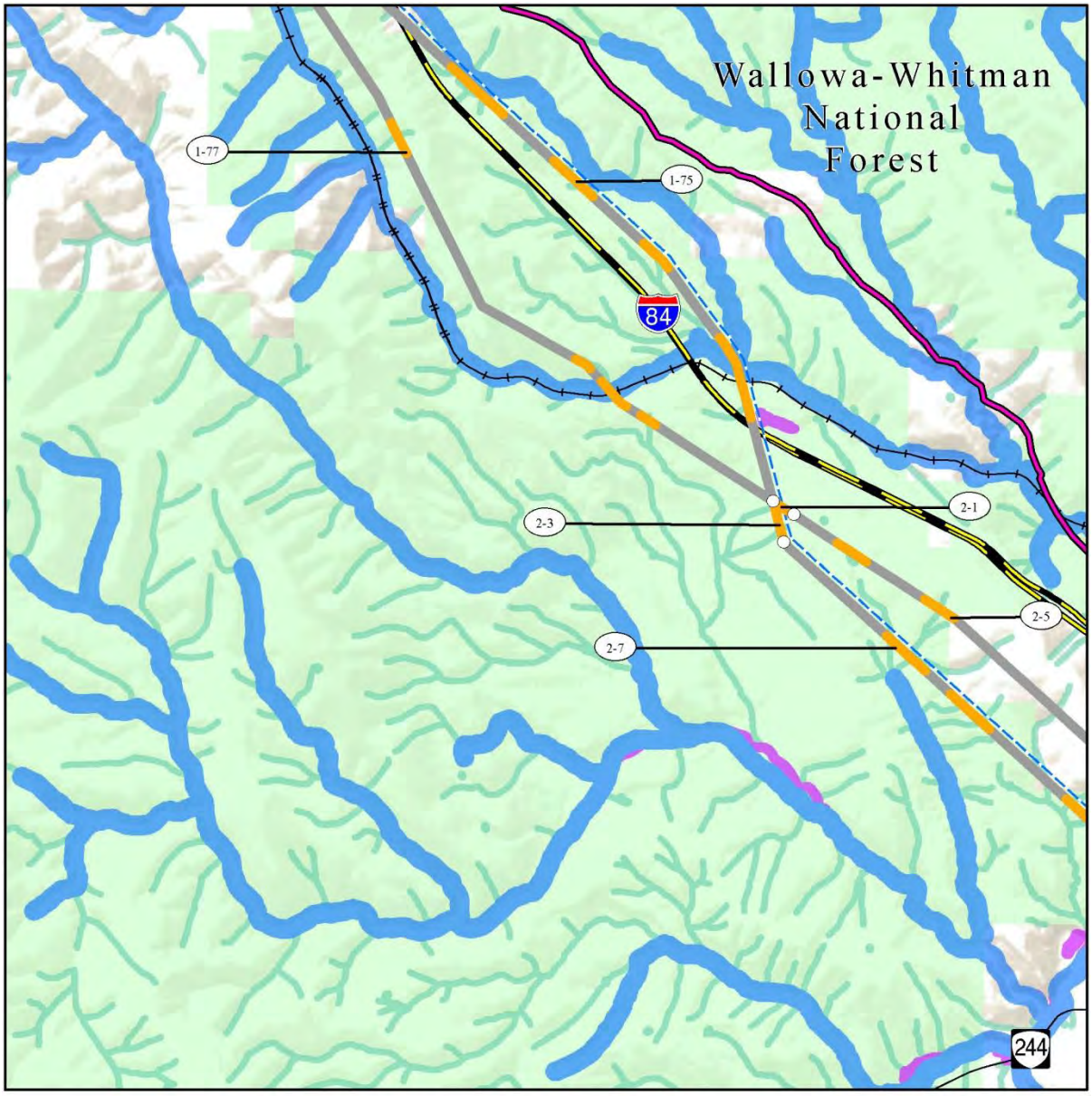
Table 3-830. Estimated Area in Riparian Conservation Areas within the 250-foot-wide Right-of-Way on the Wallowa-Whitman National Forest

Alternative Route	Riparian Conservation Areas (Miles crossed)	Area of Riparian Conservation Areas within the Right-of-Way (acres)	Area of Riparian Conservation Areas Associated with Fish-bearing Perennial Streams (Category 1) (acres)
Segment 1			
Applicant's Proposed Action (West of Bombing Range Road)[1]	1.1	12	5
Variation S1-B1	*1.1*	*12*	*5*
Variation S1-B2	*1.4*	*25*	*12*
Segment 2			
Applicant's Proposed Action[1]	0.5	3	0
Variation S2-A1	*0.5*	*3*	*0*
Variation S2-A2	*1*	*10*	*0*
Segment 3			
Applicant's Proposed Action[1]	–	–	–
Timber Canyon	6.4	97	58

Table Note: [1]Other alternative routes considered in the segment share the same alignment across the Wallowa-Whitman National Forest.

Timber Management Standards and Guidelines

PACFISH/INFISH direction for timber management (Standard TM-1) would be amended to allow timber harvest in RCAs. Felling of timber in RCAs, and in some cases its removal, associated with the B2H Project would be necessary within the 250-foot-wide right-of-way and to provide access needed for the B2H Project.



Map 3-16a

USFS Plan Amendments: Exception to PACFISH/INFISH

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

Proposed USFS Plan Amendment

Project Features

Alternative Route

Link Node

U.S. Forest Service Riparian Conservation Areas

Riparian Conservation Area: Category 1 - Fish-bearing streams - perennial

Riparian Conservation Area: Category 3 - Ponds, lakes, reservoirs, and wetlands >1 acre

Riparian Conservation Area: Category 4 - Intermittent or seasonally flowing streams and wetlands <1 acre

U.S. Forest Service

General Reference

230-kV Transmission Line

Railroad

Interstate Highway

U.S. Highway

State Highway

Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Riparian Conservation Areas compiled by EPG using the following sources: Oregon Wetlands Cover, National Wetlands Inventory, StreamNet, National Hydrography Dataset 2015, U.S. Forest Service, BLM 2014, 2015, Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012, Railroads, Idaho DOT 2006, Oregon DOT 2014, Highways, ESRI 2013, Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The B2H Project facilities, including temporary access roads, are not fully designed, and the locations of access roads to be used during construction are not known. The approach for estimating ground disturbance associated with upgrading existing access roads or constructing temporary access roads is discussed in Section 2.5.1.1. Estimated ground disturbance was considered in the analysis of proposed plan amendments.
- The plan amendments are proposed for the proposed B2H Project right-of-way.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
- No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Alternative routes last revised: February 18, 2016

Final EIS: November 2016

0 0.5 1

Miles

1:58,000 or 1 inch equals 1 miles

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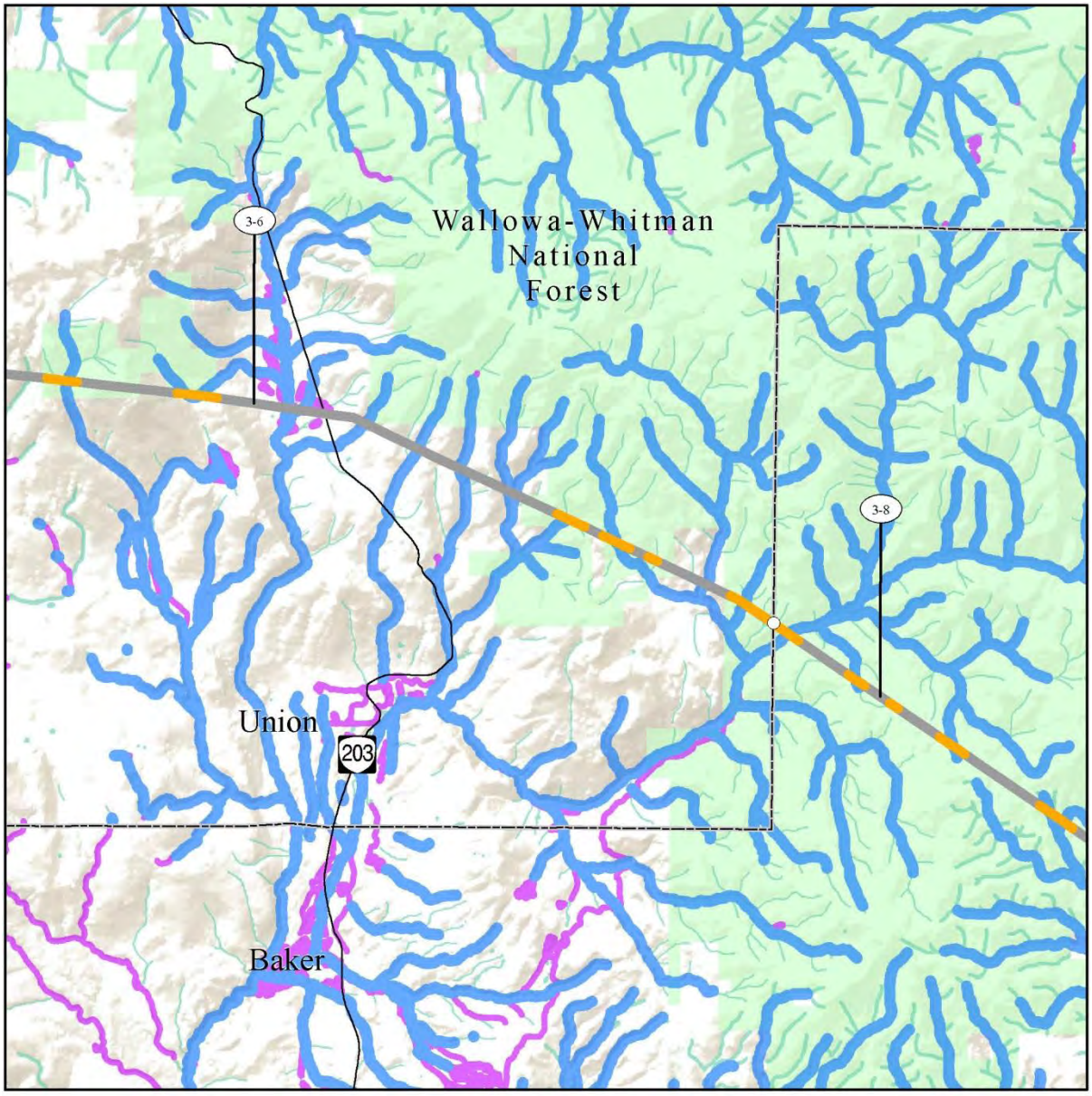

Map 3-16b

USFS Plan Amendments: Exception to PACFISH/INFISH

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Riparian Conservation Areas

- Riparian Conservation Area: Category 1 - Fish-bearing streams - perennial
- Riparian Conservation Area: Category 3 - Ponds, lakes, reservoirs, and wetlands >1 acre
- Riparian Conservation Area: Category 4 - Intermittent or seasonally flowing streams and wetlands <1 acre
- U.S. Forest Service

General Reference

- 230-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Riparian Conservation Areas compiled by EPG using the following sources: Oregon Wetlands Cover, National Wetlands Inventory, StreamNet, National Hydrography Dataset 2015, U.S. Forest Service, BLM 2014, 2015, Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013, Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The B2H Project facilities, including temporary access roads, are not fully designed, and the locations of access roads to be used during construction are not known. The approach for estimating ground disturbance associated with upgrading existing access roads or constructing temporary access roads is discussed in Section 2.5.1.1. Estimated ground disturbance was considered in the analysis of proposed plan amendments.
- The plan amendments are proposed for the proposed B2H Project right-of-way.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

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Miles
1:100,000 or 1 inch equals 2 miles

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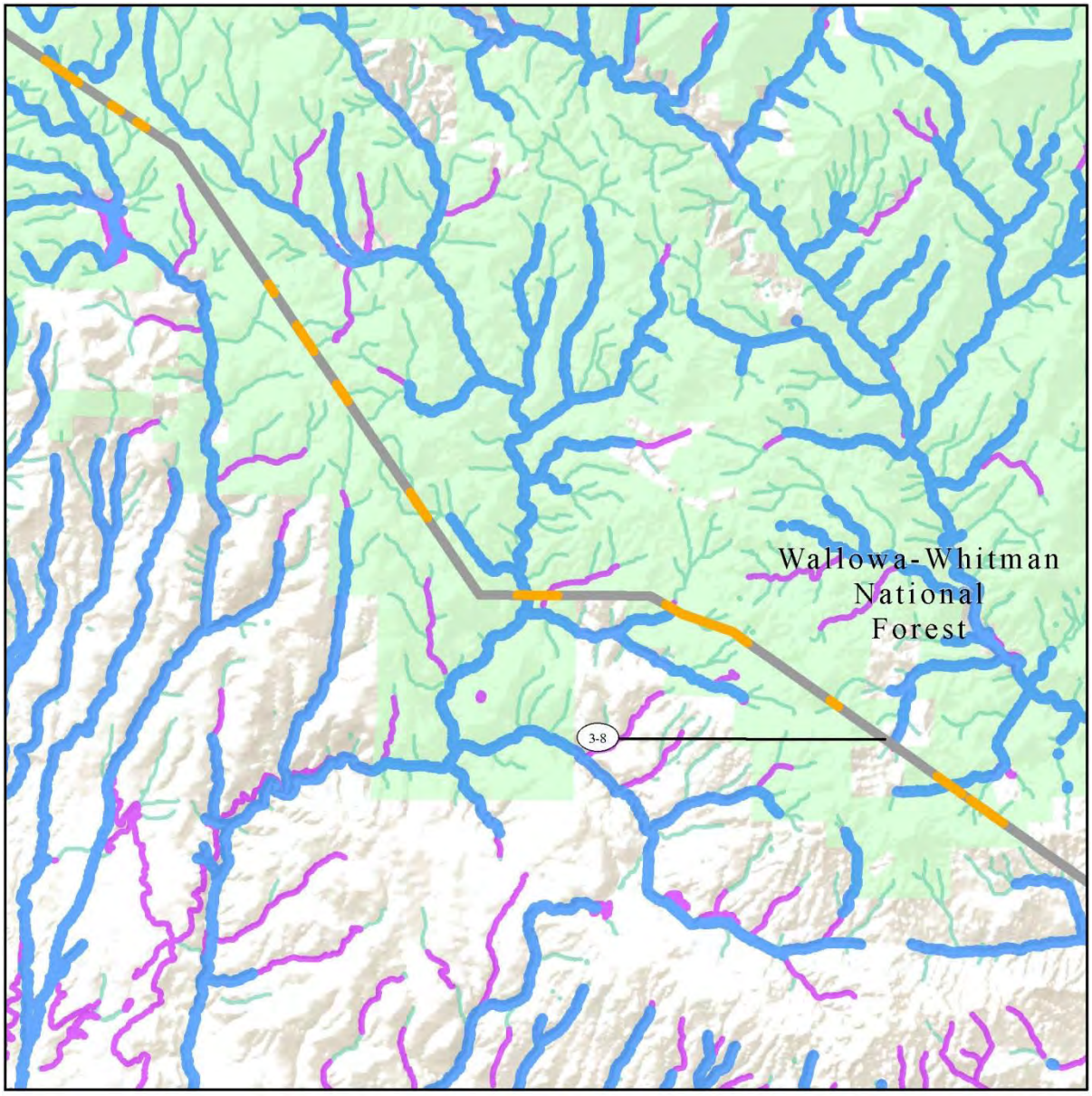

Map 3-16c

USFS Plan Amendments: Exception to PACFISH/INFISH

BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

Plan Amendments

- Proposed USFS Plan Amendment

Project Features

- Alternative Route
- Link Node

U.S. Forest Service Riparian Conservation Areas

- Riparian Conservation Area: Category 1 - Fish-bearing streams - perennial
- Riparian Conservation Area: Category 3 - Ponds, lakes, reservoirs, and wetlands >1 acre
- Riparian Conservation Area: Category 4 - Intermittent or seasonally flowing streams and wetlands <1 acre
- U.S. Forest Service

General Reference

- 230-kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Oregon National Historic Trail Congressionally Designated Alignment

SOURCES:
Riparian Conservation Areas compiled by EPG using the following sources: Oregon Wetlands Cover, National Wetlands Inventory, StreamNet, National Hydrography Dataset 2015, U.S. Forest Service, BLM 2014, 2015, Transmission Lines, Bonneville Power Administration 2009, Idaho Power Company 2007, Logan Simpson Design 2011, Ventyx 2012; Railroads, Idaho DOT 2006, Oregon DOT 2014; Highways, ESRI 2013, Oregon National Historic Trail Congressionally Designated Alignment, BLM 2015

NOTES:
- The B2H Project facilities, including temporary access roads, are not fully designed, and the locations of access roads to be used during construction are not known. The approach for estimating ground disturbance associated with upgrading existing access roads or constructing temporary access roads is discussed in Section 2.5.1.1. Estimated ground disturbance was considered in the analysis of proposed plan amendments.
- The plan amendments are proposed for the proposed B2H Project right-of-way.
- The alternative routes shown on this map are draft and may be revised or refined throughout the development of the Project.
- Each alternative route is composed of links, which are discrete sections of the route sharing common endpoints determined by the point of intersection with other adjacent links; the common endpoint is referred to as a link node. Links generally are numbered from north to south. Similarly, a segment is composed of alternative routes that share common endpoints determined by the point of intersection with other adjacent alternative routes; the common endpoint is referred to as a segment node.
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Alternative routes last revised: February 18, 2016
Final EIS: November 2016

0 0.5 1
Miles
1:100,000 or 1 inch equals 2 miles

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Lands Standards and Guidelines

PACFISH/INFISH direction for Lands (Standard LH-3) would be amended to allow issuance of a special-use authorization for the B2H Project, when some activities may retard or prevent attainment of some RMOs and may not fully avoid adverse effects on listed anadromous fish (for PACFISH, applicable to watersheds crossed by the Applicant's Proposed Action Alternative and its variations) or inland native fish (for INFISH, applicable to the Timber Canyon Alternative).

Riparian Management Objectives

PACFISH/INFISH RMOs, particularly those for water temperature, and the requirement that RCAs be managed so that activities would not retard attainment of RMOs, would be amended to allow construction and maintenance of the B2H Project.

Effects

Segments 1 and 2

For the Applicant's Proposed Action Alternative (Variations S1-B1 and S2-A1), approximately 1.6 miles of the transmission line crosses RCAs; the right-of-way would cross an estimated 15 acres of RCA (Table 3-830). Streams crossed are either intermittent or seasonally flowing (Category 4) or perennial fish-bearing (Category 1). Of the 15 acres within RCAs, 5 acres are associated with Category 1 streams. No Category 1 streams are crossed in Segment 2. Variation S1-B1 could impact an estimated 12 acres of Category 1 RCA. Variation S1-B2 could impact as many as 25 acres of RCA adjacent to Category 1 streams.

Variation S1-B2 could impact an estimated 12 acres of Category 1 RCA. Variation S2-A2 could impact as many as 10 acres of RCA, but none adjacent to Category 1 streams.

Application of design features of the B2H Project for environmental protection related to access construction and maintenance and vegetation management within the right-of-way and selective mitigation measures are expected to reduce the risk of adverse impacts on instream habitat (including large woody debris), bank stability, and riparian vegetation. More specifically, design features 1, 2, 5, 9 15, 16, 17, 18, and 20 of the B2H Project for environmental protection and selective mitigation measures 1, 2, 4 5, 8, and 12 are anticipated to reduce effects on ESA-listed fish; these are discussed Section 3.2.5. However, effects would not be completely eliminated and some would be long-term (i.e. for the life of the B2H Project). For example, removal of riparian vegetation that shades streams could result in slightly increased water temperatures that would not be mitigated and would remain for the life of the B2H Project. Effects on ESA-listed anadromous fish (i.e., Snake River Basin summer steelhead) are discussed in detail in Section 3.2.5 and in Appendix F of this EIS.

In summary, B2H Project activities within RCAs, especially at crossings of Dry Creek and California Gulch, would remove vegetation sufficient to slightly increase direct solar radiation and cause an associated slight increase stream temperature. Loss of streamside vegetation could remove cover used by fish as refuge during periods of low flow and to avoid predation. Construction and maintenance of

access roads could increase erosion, add sediment into waterways, and effect hydrologic connectivity, thus negatively impacting fish habitat.

Segment 3

Applicant's Proposed Action Alternative

In Segment 3, the Applicant's Proposed Action Alternative avoids NFS lands. No amendment of LRMP direction is necessary.

Timber Canyon Alternative

For the Timber Canyon Alternative, approximately 6.4 miles of the B2H Project would cross RCAs and an estimated 97 acres of the RCA would occur within the right-of-way (Table 3-830). Streams crossed are either intermittent or seasonally flowing (Category 4) or perennial fish-bearing (Category 1). Of the 97 acres of RCA that would be affected, 58 acres would be associated with Category 1 streams. Another 3 acres are Category 3 (ponds, lakes, reservoirs and wetlands greater than1 acre).

As with the Applicant's Proposed Action Alternative and Variations, application of design features of the B2H Project for environmental protection and selective mitigation measures are expected to reduce the risk of adverse impacts on instream habitat (including large woody debris), bank stability, and riparian vegetation. However, effects would not be completely eliminated and some would be long-term (i.e. for the life of the B2H Project). For example, removal of riparian vegetation that shades streams could result in increased water temperatures that could not be mitigated and would remain for the life of the project.

Effects to inland fish, in particular redband trout, are discussed in detail in the MIS analysis (refer to Appendix F) and in Section 3.2.5. In summary, B2H Project activities within RCAs, especially at B2H crossings of Big Creek and Goose Creek, would remove vegetation sufficient to slightly increase direct solar radiation and cause an associated slight increase stream temperature. Loss of streamside vegetation could remove cover used by fish as refuge during periods of low flow and to avoid predation. Construction and maintenance of access roads could increase erosion, add sediment into waterways, and effect hydrologic connectivity, thus negatively impacting inland fish habitat.

Cumulative Effects

Two past project-specific amendments to PACFISH, for the Darkhorn Salvage Project and Spring Creek Restoration projects (both signed in 1996) authorized harvest in RCAs. Recent review of these decisions, and comparison to PACFISH direction, indicates that the harvest within RCAs could have been approved without amending. Both decisions indicate that RCA treatments were designed and applied to acquire desired vegetation characteristics where needed to attain RMOs, and that the actions would not retard attainment of RMOs; this is consistent with exception (b) to standard TM-1. No cumulative effects at the project- or Forest-wide scale would result from the proposed amendment of PACFISH/INFISH for the B2H Project.

EVALUATION OF SIGNIFICANCE OF PROPOSED FOREST PLAN AMENDMENTS

Under the 2012 Planning Rule (Title 36, Code of Federal Regulations, Part 219–Planning) the responsible official may complete and approve the plan revision in conformance with the provisions of the prior planning regulation, including the transition provisions of the reinstated 2000 rule (36 CFR part 299, published at 36 CFR parts 200 to 299, revised as of July 1, 2010). The transition provisions allow the use of the 1982 planning procedures (see CFR parts 200 to 299, revised as of July 1, 2000). See the following hyperlink for the 1982 planning procedures: http://www.fs.fed.us/emc/nfma/includes/nfmareg.html. While the Draft EIS for the B2H Project indicated the USFS was considering using the 2012 planning rule procedures, the USFS responsible official for the B2H Project has elected to use the 1982 procedures for the proposed forest plan amendments because the timeline for B2H Project completion will fall within the window of time allowed under the transition to the 2012 planning rule (Project Record).

LRMP amendments proposed in the B2H Final EIS have been reviewed for significance under the National Forest Management Act implementing regulation. The USFS Land and Resource Management Planning Manual (USFS Manual 1920, Section 1926 – Land Management Planning Using Planning Regulations in Effect Before November 9, 2000) lists the changes to the land management plan that are non-significant, which can result from (FSM 1926.51):

1. Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management.
2. Adjustments of MA boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple use goals and objectives for long-term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Conversely, significant changes to the land management plan may be caused by circumstances indicated in the following examples (FSM 1926.52):

- Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected.
- Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

A review of the effects of the proposed amendments to the LRMP, summarized below, indicates that these changes to the LRMP would be non-significant. Proposed amendments are specific to the activities associated with construction and maintenance of the B2H Project. They impact a relatively small portion of the Wallowa-Whitman National Forest and would not apply to future projects. For all proposed amendments, the context and intensity of the changes are limited due to the small number of acres affected when compared to the forest as a whole; as such, any change in the level of multiple-use goods and services projected would be minor; adjustments in boundaries and prescriptions would

not cause significant changes in multiple use goals and objectives; the change in standards and guidelines would be limited in context and intensity and considered to be minor. No other projects or activities are proposed that would contribute to management prescriptions applied to the B2H Project.

Management Area Direction

Amendment of the LRMP to allow management following direction for MA-17 for land used for the B2H Project would be necessary for the Timber Canyon Alternative. This B2H Project-specific amendment would apply to the 250-foot-wide right-of-way and access roads for purposes of constructing and maintaining the B2H Project, and would remain in place for the life of the B2H Project. These adjustments would be implemented on fewer than 600 acres and are not expected to significantly alter the multiple-use goals and objectives for the Forest for long-term land and resource management, as the changes would apply to a small percentage of the total land-base on the forest.

Visual Resources

The effects of amending the LRMP direction for visual resources would be limited to the changed VQO for polygons intersected by the 250-foot-wide right-of-way and access roads and facilities, and only for purposes of implementing the B2H Project. It is not anticipated that this would significantly alter the multiple-use goals for long-term land and resource management, given the limited magnitude of the change. The proposed changes to VQOs in MA-17 are consistent with the purposes of this allocation.

Eastside Screens

The effects of amending the LRMP for Eastside Screens in Segments 1 and 2 would be limited to acres within the 250-foot-wide right-of-way and access roads, and only for purposes of implementing and maintaining the B2H Project. It is not anticipated that this would significantly alter the multiple-use goals for long-term land and resource management, given the limited magnitude of the change. As an example, the potential reduction of timber production resulting from the estimated loss of production from forested stands within the right-of-way for the Applicant's Proposed Action Alternative and variations, and the Timber Canyon Alternative, for the life of the B2H Project, would not represent a significant difference from the levels of timber production projected in the LRMP.

PACFISH and INFISH

Amendments to the LRMP for PACFISH in would be limited to RCA acres within the 250-foot-wide right-of-way and access roads, and only for purposes of implementing and maintaining the B2H Project. It is not anticipated that this would significantly alter the multiple-use goals for long-term land and resource management, given the limited magnitude of the change. As an example, the proposed timber harvest within RCAs would be a subset of that described above for amendment of Eastside Screens. The even smaller potential reduction of timber production (resulting from harvest in RCAs) and the estimated loss of production from any forested riparian stands would not represent a significant difference from the levels of timber production projected in the LRMP.

3.4.3 SUMMARY OF EFFECTS

3.4.3.1 BLM RESOURCE MANAGEMENT PLANS

For the Applicant's Proposed Action Alternative, the Baker RMP would need to be amended to reclassify approximately 20 acres of VRM Class III to VRM Class IV, which represents reclassification of less than 0.1 percent of the current VRM Class III lands in the Baker RMP planning area. The Southeastern Oregon RMP would also need to be amended for the Applicant's Proposed Action Alternative to reclassify approximately 46 acres from VRM Class II to VRM Class IV, and 8 acres from VRM Class III to VRM Class IV, which represents reclassification of less than 0.1 percent of the current VRM Class II and III lands and in the Malheur Field Office. Variation S5-B2 would also require an amendment to the Southeastern Oregon RMP to reclassify approximately 20 acres from VRM Class II to VRM Class IV and 15 acres from VRM Class III to VRM Class IV.

Flagstaff B – Durkee Alternative would require an amendment to the Baker RMP to reclassify approximately 5 acres of VRM Class II to VRM Class IV out of 151,711 acres of VRM Class III in the Baker RMP planning area. Similarly, the Flagstaff B – Burnt River West Alternative would require an amendment to the Baker RMP to reclassify approximately 23 acres of VRM Class II to VRM Class IV. The Southeastern Oregon RMP would need to be amended to reclassify approximately 51 acres of VRM Class III to VRM Class IV in order to approve the Tub Mountain South Alternative, out of 199,078 acres of VRM Class III in the Malheur Field Office. The Southeastern Oregon RMP would also need to be amended to reclassify 22 acres or 52 acres of VRM Class II to VRM Class IV to approve either the Malheur S or Malheur A alternatives, out of 144,403 acres of current VRM Class II in the Malheur Field Office.

Although B2H Project and potential future effects on the visual resources at the locations of the amendments would be noticeable, the RMP amendments necessary for approval of the Applicant's Proposed Action Alternative or any of the alternative routes would have low long-term overall effects on the visual resources or visual resource management in either the Baker or Southeastern Oregon RMPs.

3.4.3.2 WALLOWA-WHITMAN LAND AND RESOURCE MANAGEMENT PLAN

For the Applicant's Proposed Action Alternative, amendment of three areas of the LRMP would be necessary. In order to approve authorization of the Applicant's Proposed Action Alternative the Wallowa-Whitman National Forest LRMP would need to be amended to re-assign areas currently designated as VQO Partial Retention, Retention and Modified to VQO Maximum Modification (Table 3-826). The location of the re-designations would be within an existing utility corridor through the Blue Mountains that generally parallels Interstate-84 and includes an existing transmission line. The existing visual intrusions and the relatively small area of re-designation would make the overall effects on visual resources in the forest long-term but low in extent. Acres of Maximum Modified would increase forest-wide by about 11 percent. Application of B2H Project design features for environmental protection would further reduce visual effects.

Authorization of the Applicant's Proposed Action Alternative would also require the LRMP direction in Eastside Screens be amended to allow sale of timber to occur in LOS stands below HRV; remove trees 21 inches dbh or greater; reduce connectivity between LOS stands and increase fragmentation of LOS; reduce snags, green tree replacement, and down wood below prescribed levels; and, allow effects on historical goshawk nests and harvest within 30 acres of the most suitable nesting habitat surrounding historical nest trees and 400-acrePFAs. It is anticipated that implementation of the Applicant's Proposed Action Alternative (Variation S1-B2 and S2-A2), would result in loss of approximately 155 acres of forested habitat, including <1 acres of LOS. This would reduce connectivity of existing old-growth and LOS stands. However, analysis indicates this would not result in any reduction of viability for populations of old-growth dependent MIS. Implementation of the Applicant's Proposed Action Alternative would require amendment of PACFISH guidance to enable removal of vegetation in 15 acres of RCAs, and to allow the construction, upgrading and maintenance of access roads located within RCAs.

Approval of the Timber Canyon Alternative on NFS lands would require amendment of four areas of LRMP guidance. Amendments for visual resource direction for Eastside Screens and for PACFISH/INFISH, similar to those needed for the Applicant's Proposed Action Alternative would be required; however, for the Timber Canyon Alternative amendments would apply to a larger area. An increase in the acres of Maximum Modified VQO by approximately 44,400 would result in a forest-wide increase of about 94 percent (Table 3-826). Amendments to Eastside Screens direction would apply to an estimated 557 acres, including 73 acres of LOS (Table 3-827). PACFISH/INFISH would be amended to allow vegetation removal within 97 acres of RCA within the right-of-way, and to allow the construction, upgrading and maintenance of access roads located within RCAs.

Authorization of the Timber Canyon Alternative would also require B2H Project-specific amendment to allow management of NFS lands intersected by the 250-foot-wide right-of-way and access roads, for purposes of construction and maintaining the B2H Project for the life of the B2H Project, to follow LRMP guidance for MA-17 (Power Transportation Facility Retention).

All amendments proposed would be project-specific. Amendments would apply only to B2H Project-related activities and would remain in place for the life of the B2H Project.