B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

BP-16 Rate Proceeding

Power Revenue Requirement Study

BP-16-FS-BPA-02

July 2015

POWER REVENUE REQUIREMENT STUDY

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FIGURE AND TABLES

COMMONLY USED ACRONYMS AND SHORT FORMS

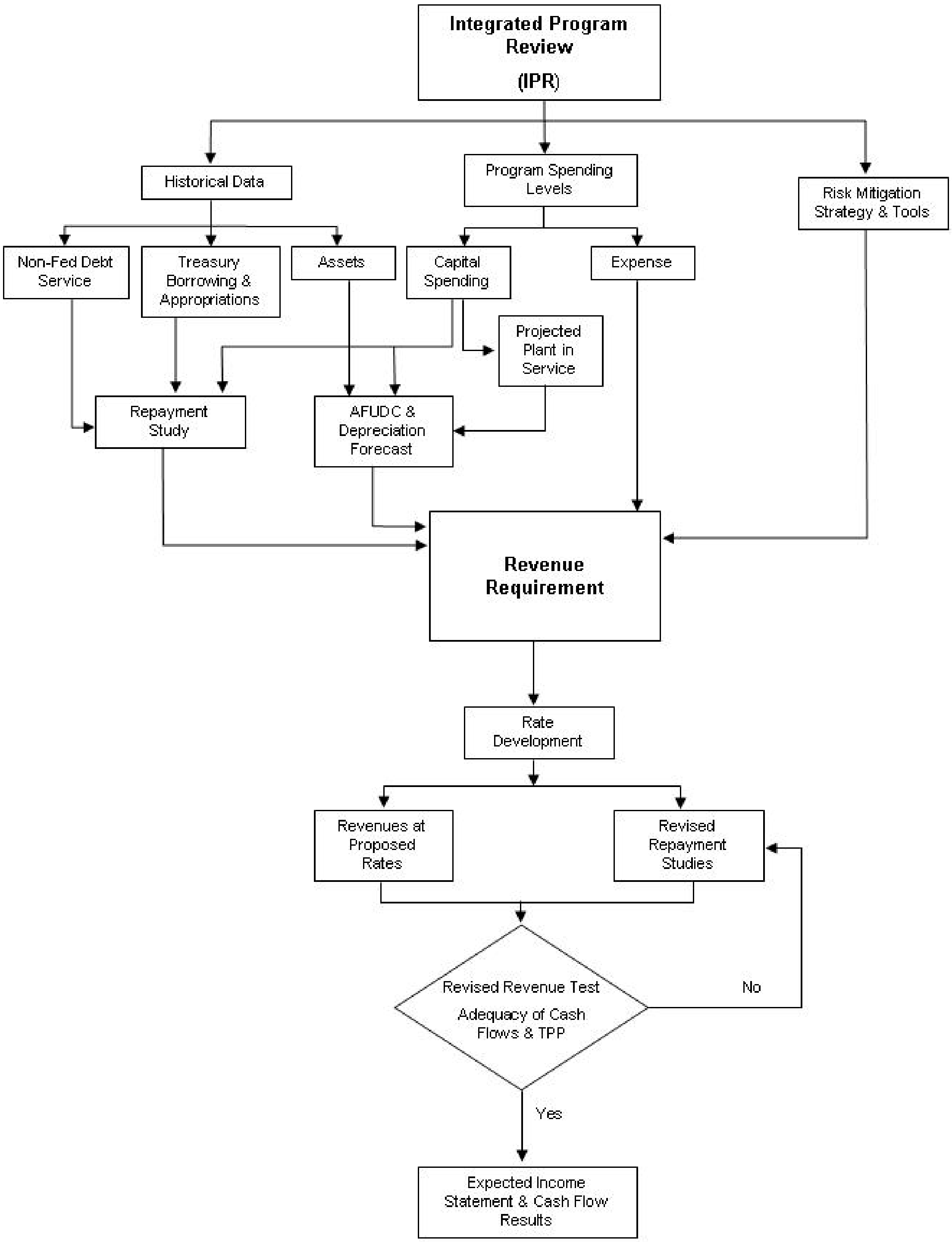
ACNR	Accumulated Calibrated Net Revenue
ACS	Ancillary and Control Area Services
AF	Advance Funding
aMW	average megawatt(s)
ANR	Accumulated Net Revenues
ASC	Average System Cost
BAA	Balancing Authority Area
BiOp	Biological Opinion
BPA	Bonneville Power Administration
Btu	British thermal unit
CDQ	Contract Demand Quantity
CGS	Columbia Generating Station
CHWM	Contract High Water Mark
CIR	Capital Investment Review
COE	U.S. Army Corps of Engineers
COI	California-Oregon Intertie
Commission	Federal Energy Regulatory Commission
Corps	U.S. Army Corps of Engineers
COSA	Cost of Service Analysis
COU	consumer-owned utility
Council	Northwest Power and Conservation Council
CP	Coincidental Peak
CRAC	Cost Recovery Adjustment Clause
CSP	Customer System Peak
CT	combustion turbine
CY	calendar year (January through December)
DDC	Dividend Distribution Clause
dec	decrease, decrement, or decremental
DERBS	Dispatchable Energy Resource Balancing Service
DFS	Diurnal Flattening Service
DNR	Designated Network Resource
DOE	Department of Energy
DOI	Department of Interior
DSI	direct-service industrial customer or direct-service industry
DSO	Dispatcher Standing Order
EE	Energy Efficiency
EIS	Environmental Impact Statement
EN	Energy Northwest, Inc.
ESA	Endangered Species Act
ESS	Energy Shaping Service
e-Tag	electronic interchange transaction information
FBS	Federal base system
FCRPS	Federal Columbia River Power System
FCRTS	Federal Columbia River Transmission System

FELCC	firm energy load carrying capability
FORS	Forced Outage Reserve Service
FPS	Firm Power and Surplus Products and Services
FPT	Formula Power Transmission
FY	fiscal year (October through September)
G&A	general and administrative (costs)
GARD	Generation and Reserves Dispatch (computer model)
GMS	Grandfathered Generation Management Service
GSR	Generation Supplied Reactive
GRSPs	General Rate Schedule Provisions
GTA	General Transfer Agreement
GWh	gigawatthour
HLH	Heavy Load Hour(s)
HOSS	Hourly Operating and Scheduling Simulator (computer model)
HYDSIM	Hydrosystem Simulator (computer model)
IE	Eastern Intertie
IM	Montana Intertie
inc	increase, increment, or incremental
IOU	investor-owned utility
IP	Industrial Firm Power
IPR	Integrated Program Review
IR	Integration of Resources
IRD	Irrigation Rate Discount
IRM	Irrigation Rate Mitigation
IRMP	Irrigation Rate Mitigation Product
IS	Southern Intertie
kcfs	thousand cubic feet per second
kW	kilowatt
kWh	kilowatthour
LDD	Low Density Discount
LLH	Light Load Hour(s)
LPP	Large Project Program
LPTAC	Large Project Targeted Adjustment Charge
Maf	million acre-feet
Mid-C	Mid-Columbia
MMBtu	million British thermal units
MRNR	Minimum Required Net Revenue
MW	megawatt
MWh	megawatthour
NCP	Non-Coincidental Peak
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NFB	**N**ational Marine Fisheries Service (NMFS) **F**ederal Columbia River Power System (FCRPS) **B**iological Opinion (BiOp)
NIFC	Northwest Infrastructure Financing Corporation
NLSL	New Large Single Load

NMFS	National Marine Fisheries Service
NOAA Fisheries	National Oceanographic and Atmospheric Administration Fisheries
NORM	Non-Operating Risk Model (computer model)
Northwest Power Act	Pacific Northwest Electric Power Planning and Conservation Act
NP-15	North of Path 15
NPCC	Pacific Northwest Electric Power and Conservation Planning Council
NPV	net present value
NR	New Resource Firm Power
NRFS	NR Resource Flattening Service
NT	Network Integration
NTSA	Non-Treaty Storage Agreement
NUG	non-utility generation
NWPP	Northwest Power Pool
OATT	Open Access Transmission Tariff
O&M	operation and maintenance
OATI	Open Access Technology International, Inc.
OMP	Oversupply Management Protocol
OS	Oversupply
OY	operating year (August through July)
PDCI	Pacific DC Intertie
Peak	Peak Reliability
PF	Priority Firm Power
PFIA	Projects Funded in Advance
PFp	Priority Firm Public
PFx	Priority Firm Exchange
PNCA	Pacific Northwest Coordination Agreement
PNRR	Planned Net Revenues for Risk
PNW	Pacific Northwest
POD	Point of Delivery
POI	Point of Integration or Point of Interconnection
POR	Point of Receipt
Project Act	Bonneville Project Act
PRS	Power Rates Study
PS	Power Services
PSC	power sales contract
PSW	Pacific Southwest
PTP	Point to Point
PUD	public or people's utility district
PW	WECC and Peak Service
RAM	Rate Analysis Model (computer model)
RD	Regional Dialogue
REC	Renewable Energy Certificate
Reclamation	U.S. Bureau of Reclamation
REP	Residential Exchange Program
REPSIA	REP Settlement Implementation Agreement

RevSim	Revenue Simulation Model
RFA	Revenue Forecast Application (database)
RHWM	Rate Period High Water Mark
ROD	Record of Decision
RPSA	Residential Purchase and Sale Agreement
RR	Resource Replacement
RRS	Resource Remarketing Service
RSC	Resource Shaping Charge
RSS	Resource Support Services
RT1SC	RHWM Tier 1 System Capability
SCD	Scheduling, System Control, and Dispatch rate
SCS	Secondary Crediting Service
SDD	Short Distance Discount
SILS	Southeast Idaho Load Service
Slice	Slice of the System (product)
T1SFCO	Tier 1 System Firm Critical Output
TCMS	Transmission Curtailment Management Service
TGT	Townsend-Garrison Transmission
TOCA	Tier 1 Cost Allocator
TPP	Treasury Payment Probability
TRAM	Transmission Risk Analysis Model
Transmission System Act	Federal Columbia River Transmission System Act
Treaty	Columbia River Treaty
TRL	Total Retail Load
TRM	Tiered Rate Methodology
TS	Transmission Services
TSS	Transmission Scheduling Service
UAI	Unauthorized Increase
UFT	Use of Facilities Transmission
UIC	Unauthorized Increase Charge
ULS	Unanticipated Load Service
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish & Wildlife Service
VERBS	Variable Energy Resources Balancing Service
VOR	Value of Reserves
VR1-2014	First Vintage Rate of the BP-14 rate period (PF Tier 2 rate)
VR1-2016	First Vintage Rate of the BP-16 rate period (PF Tier 2 rate)
WECC	Western Electricity Coordinating Council
WSPP	Western Systems Power Pool

Figure 1: Generation Revenue Requirement Process



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1. INTRODUCTION

1.1 Purpose of Study

The purpose of the Power Revenue Requirement Study is to establish the revenues from wholesale power rates and other power sales and services that are necessary to recover, in accordance with sound business principles, the Federal Columbia River Power System (FCRPS) costs associated with the production, acquisition, marketing, and conservation of electric power. The revenue requirement developed in this study includes recovery of the Federal investment in hydro generation, fish and wildlife, and conservation costs; Federal agencies' operations and maintenance (O&M) expenses allocated to power; capitalized contract expenses associated with non-Federal power suppliers, such as Energy Northwest (EN); other power purchase expenses, such as short-term power purchases; power marketing expenses; costs of transmission services necessary for the sale and delivery of FCRPS power; and all other generation-related costs incurred by the Bonneville Power Administration (BPA) pursuant to law.

The cost evaluation period, as defined by the Federal Energy Regulatory Commission (Commission), is the period extending from the last year for which historical information is available through the proposed rate period. The cost evaluation period for this rate filing includes fiscal year (FY) 2015 and the proposed rate period, FY 2016–2017. This study is based on generation revenue requirements that include the results of generation repayment studies. This study does not include the revenue requirement or a cost recovery demonstration for BPA's transmission function. *See* Transmission Revenue Requirement Study, BP-16-FS-BPA-08.

This study outlines the policies, forecasts, assumptions, and calculations used to determine the generation revenue requirement. The Power Revenue Requirement Study Documentation, BP-16-FS-BPA-02A, contains key technical assumptions and calculations, the results of the generation repayment studies, and further explanation of the repayment program and its outputs.

The revenue requirement for this study is developed using a cost accounting analysis comprised of three parts. First, repayment studies for the generation function are prepared to determine the schedule of amortization payments and to project annual interest expense for bonds and appropriations that fund the Federal investment in hydro, fish and wildlife recovery, conservation, and other generation assets. Repayment studies are conducted for each year of the rate period and extend over the 50-year repayment period. Second, generation operating expenses and Minimum Required Net Revenues (MRNR) are projected for each year of the rate period. Third, annual Planned Net Revenues for Risk (PNRR) are determined after taking into account risks, BPA's cost recovery goals, and other risk mitigation measures, as described in the Power Risk and Market Price Study, BP-16-FS-BPA-04. From these three steps, the revenue requirement is set at the revenue level necessary to fulfill cost recovery requirements and objectives. This process is depicted in Figure 1. Once the revenue requirement is completed, the costs identified in it are passed to the rate development process, where they are allocated to the appropriate cost pools and used to develop rates in the Power Rates Study, BP-16-FS-BPA-01.

Consistent with Department of Energy (DOE) Order RA 6120.2 and the standards applied by the Commission on review of BPA's rates, BPA must demonstrate the adequacy of both current and proposed rates. BPA conducts a current revenue test to determine whether revenues projected from current rates meet cost recovery requirements for the rate period and the repayment period. If the current revenue test indicates that cost recovery and risk mitigation requirements are met, current rates could be extended through the proposed rate approval period. The current revenue test, described in section 3.2 of this study, demonstrates that revenues from current rates will not recover the generation revenue requirement for the rate period.

The revised revenue test, which is performed after calculation of the proposed power rates, determines whether projected revenues from proposed rates meet cost recovery requirements and objectives for the rate test and repayment periods. The revised revenue test, described in section 3.3 of this study, demonstrates that revenues from the proposed power rates will recover generation costs in the rate period and over the ensuing 50-year repayment period. In addition, revenues from the proposed rates, together with risk mitigation tools, are sufficient to meet BPA's 95 percent Treasury Payment Probability (TPP) standard that all U.S. Treasury payments will be paid on time and in full, as discussed in the Power Risk and Market Price Study, BP-16-FS-BPA-04.

Table 1 summarizes the revised revenue test and shows projected net revenues from proposed power rates for FY 2016–2017. These net revenues are the lowest level necessary to achieve BPA's cost recovery objectives, when combined with other risk mitigation tools, given hydro condition uncertainty, market price volatility, and other risks.

Table 2 shows planned generation amortization payments to the U.S. Treasury for each year of the rate period and irrigation assistance payments that are due to be paid from power revenues.

1.2 Legal Requirements

This section summarizes the statutory framework that guides the development of BPA's generation revenue requirement and the recovery of BPA's generation costs from the various users of the FCRPS, and the repayment policies BPA follows in the development of its revenue requirement.

1.2.1 Governing Authorities

BPA's revenue requirements are governed primarily by four legislative acts: the Bonneville Project Act of 1937, Pub.L. No. 75-329, 50 Stat. 731; the Flood Control Act of 1944, Pub.L. No. 78-534, 58 Stat. 890, amended 1977; the Federal Columbia River Transmission System Act (Transmission System Act) of 1974, Pub.L. No. 93-454, 88 Stat. 1376; and the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act), Pub.L. No. 96-501, 94 Stat. 2697. The Omnibus Consolidated Rescissions and Appropriations Act of 1996, Pub.L. No. 104-134, 110 Stat. 1321, also guides the development of BPA's revenue requirements. DOE Order "Power Marketing Administration Financial Reporting," RA 6120.2, issued by the Secretary of Energy, provides guidance to Federal power marketing administrations regarding repayment of the Federal investment. In addition, policies issued by the Commission provide guidance on separate accounting for transmission system costs. *See, e.g., Bonneville Power Admin.*, 25 FERC ¶ 61,140 (1983).

1.2.1.1 Legal Requirements Governing BPA's Revenue Requirement

BPA's rates must be set to ensure that revenues are sufficient to recover costs. This requirement was first set forth in section 7 of the Bonneville Project Act, 16 U.S.C. § 832f (as amended 1977), which provides that:

> Rate schedules shall be drawn having regard to the recovery (upon the basis of the application of such rate schedules to the capacity of the electric facilities of the Bonneville project) of the cost of producing and transmitting such electric energy, including the amortization of the capital investment over a reasonable period of years.

This cost recovery principle was repeated for Army reservoir projects in section 5 of the Flood Control Act of 1944, 16 U.S.C. § 25s. In 1974, section 9 of the Transmission System Act, 16 U.S.C. § 838g, expanded the cost recovery principle so that BPA's rates also would be set to recover:

> payments provided [in the Administrator's annual budget] … at levels to produce such additional revenues as may be required, in the aggregate with all other revenues of the Administrator, to pay when due the principal of, premiums, discounts, and expenses in connection with the issuance of and interest on all bonds issued and outstanding pursuant to [this Act,] and amounts required to establish and maintain reserve and other funds and accounts established in connection therewith.

The Northwest Power Act reiterates and clarifies the cost recovery principle. Section 7(a)(1) of the Northwest Power Act, 16 U.S.C. § 839e(a)(1), provides that:

> The Administrator shall establish, and periodically review and revise, rates for the sale and disposition of electric energy and capacity and for the transmission of non-Federal power. Such rates shall be established and, as appropriate, revised to recover, in accordance with sound business principles, the costs associated with the acquisition, conservation, and transmission of electric power, including the amortization of the Federal investment in the Federal Columbia River Power System (including irrigation costs required to be repaid out of power revenues) over a reasonable period of years and the other costs and expenses incurred by the Administrator pursuant to this chapter and other provisions of law. Such rates shall be established in accordance with Sections 9 and 10 of the Federal Columbia River Transmission System Act (16 U.S.C. § 838), Section 5 of the Flood Control Act of 1944, and the provisions of this chapter.

Section 7(a)(2) of the Northwest Power Act, 16 U.S.C. § 839e(a)(2), provides that the Commission shall issue a confirmation and approval of BPA's rates upon a finding that the rates

(A) are sufficient to assure repayment of the Federal investment in the Federal Columbia River Power System over a reasonable number of years after first meeting the Administrator's other costs;

(B) are based upon the Administrator's total system costs; and

(C) insofar as transmission rates are concerned, equitably allocate the costs of the Federal transmission system between Federal and non-Federal power utilizing such system.

Development of the revenue requirement is a critical component of meeting the statutory cost recovery principles relevant to BPA. The costs associated with the FCRPS and associated services and expenses, as well as other costs incurred by the Administrator in furtherance of BPA's mission, are included in this study.

1.2.1.2 The BPA Appropriations Refinancing Act

As in the last rate period, BPA's power rates for the FY 2016–2017 rate period will reflect the requirements of the Refinancing Act, 16 U.S.C. § 838l, part of the Omnibus Consolidated Rescissions and Appropriations Act of 1996, Pub.L. No. 104-134, 110 Stat. 1321, enacted in April 1996. The Refinancing Act requires that unpaid principal on BPA appropriations ("old capital investments") at the end of FY 1996 be reset at the present value of the principal and annual interest payments BPA would make to the U.S. Treasury for these obligations absent the Refinancing Act, plus $100 million. 16 U.S.C. § 838l(b). The Refinancing Act also specifies that the new principal amounts of the old capital investments be assigned new interest rates from the Treasury yield curve prevailing at the time of the refinancing transaction. 16 U.S.C. § 838l(a)(6)(A).

The Refinancing Act restricted prepayment of the new principal for old capital investments to $100 million during the first five years after the effective date of the financing. 16 U.S.C. § 838l(e). The Refinancing Act also specifies that repayment dates on new principal amounts may not be earlier than the repayment dates for old capital investments. 16 U.S.C. § 838l(d). The Refinancing Act further directs the Administrator to offer to provide assurance in new or existing contracts for power, transmission, or related services that the Government will not increase the repayment obligations in the future. 16 U.S.C. § 838l(i).

1.2.1.3 Allocation of FCRPS Costs

The individual generating projects comprising the FCRPS serve purposes in addition to power production, including navigation, irrigation, recreation, and flood control. The total costs of these Federal projects are allocated to the power revenue requirement and the appropriate cost pools and are generally allocated according to the purposes they serve.

For projects that provide power generation to the FCRPS, this allocation has generally been accomplished pursuant to statutory direction. For example, section 7 of the Bonneville Project Act, 16 U.S.C. § 832f, requires that BPA's rates be based on, *inter alia*, "an allocation of costs made by the [Secretary of Energy,]" and, insofar as costs of the Bonneville Project are concerned:

> [T]he Secretary of Energy may allocate to the costs of electric facilities such a share of the cost of facilities having joint value for the production of electric energy and other purposes as the power development may fairly bear as compared with other such purposes.

Id.

Similar allocations for Reclamation projects constructed pursuant to various authorizing statutes have been performed by the Secretary of the Interior under the authority of 43 U.S.C. § 485h(a)-(b). Cost allocations for projects constructed by the Corps have been performed by the Secretary of the Army and approved by the Federal Power Commission (the predecessor to the Federal Energy Regulatory Commission).

In general, an attempt is made to allocate the cost of each feature of a multipurpose dam to the purpose it serves. For example, the costs of powerhouses, penstocks, and other specific power-related facilities have been allocated to the generation function, whereas the costs of navigation locks have been allocated to navigation. More problematic are the joint-use costs that remain unallocated after the costs identifiable to single purposes have been allocated. The joint-use formulas approximate the relative benefits provided by each function, and costs are allocated accordingly.

Thus, costs assigned to the power production functions include specific cost items whose sole purpose is power production and the "power production share" of joint costs assigned to more than one purpose. Both types of costs are included in BPA's generation revenue requirement.

1.2.1.4 Section 4(h)(10)(C) Credit

The Northwest Power Act provides that:

> The Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator under this Act and other laws administered by the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries ….

16 U.S.C. § 839b(h)(10)(A).

BPA is not obligated to reimburse the U.S. Treasury for the non-power portion of these fish and wildlife costs. Such non-power costs are instead allocated to the various project purposes by the BPA Administrator, in consultation with the Corps and Reclamation, pursuant to section 4(h)(10)(C) of the Northwest Power Act. 16 U.S.C. § 839b(h)(10)(C). This allocation to various project purposes implements the principle that electric power consumers bear no greater share of the costs of fish and wildlife mitigation than the power portion of the project.

The legislative history of section 4(h)(10)(C) illustrates how the expenditures by the Administrator for protection, mitigation, and enhancement of fish and wildlife at individual Federal projects in excess of the portion allocable to electric consumers are to be treated as a credit for electric consumers. H.R. Rep. No. 976, 96th Cong., 2d Sess., pt. 2 at 45 (1980), *reprinted in* 1980 U.S.C.C.A.N. 5989, 6011. This principle is satisfied by treating expenditures on behalf of non-power purposes as other project costs. BPA receives a credit against its cash transfers to the U.S. Treasury for expenditures attributable to non-power purposes. BPA's initial funding of all the costs for fish and wildlife has the advantage of avoiding the need for funding the non-power portion of these costs through the annual appropriations process.

1.2.1.5 Colville Settlement Act Credits

The Confederated Tribes of the Colville Reservation Grand Coulee Dam Settlement Act approves and ratifies the Settlement Agreement entered into by the United States and the Confederated Tribes of the Colville Reservation (Colville Tribes) related to the Tribes' claims for a portion of the revenues from Grand Coulee Dam, and directs BPA to carry out its obligations under the Settlement Agreement. P.L. No. 103-436, Nov. 2, 1994, 108 Stat. 4577.

The Settlement Agreement obligates BPA to make annual payments to the Colville Tribes. Payments have been tied to BPA's average prices and the amount of annual generation from

Grand Coulee Dam. Under the Refinancing Act, part of the Omnibus Consolidated Rescissions and Appropriations Act of 1996, P.L. No. 104-134, 110 Stat. 1321, BPA receives annual credits from the U.S. Treasury against payments due the U.S. Treasury in order to defray a portion of the costs of making payments to the Colville Tribes. The annual payments to the Colville Tribes are forecast to average $19.5 million per year in FY 2016 and FY 2017. The credits for the FY 2016–2017 rate period are $4.6 million in each fiscal year.

1.2.2 Repayment Requirements and Policies

1.2.2.1 Separate Repayment Studies

Section 10 of the Transmission System Act, 16 U.S.C. § 838h, and section 7(a)(2)(C) of the Northwest Power Act, 16 U.S.C. § 839e(a)(2)(C), provide that the recovery of the costs of the Federal transmission system shall be equitably allocated between Federal and non-Federal power utilizing such system. In 1982, the Commission first directed BPA to provide accounting and repayment statements for its transmission system separate and apart from the accounting and repayment statements for the Federal generation system. *Bonneville Power Admin.*, 20 FERC ¶ 61,142 (1982). The Commission required BPA to establish books of account for the FCRTS separate from its generation books of account; explained that the FCRTS shall be comprised of all investments, including administrative and management costs, related to the transmission of electric power; and directed BPA to develop repayment studies for its transmission function separate from those for its generation function. Such studies must set forth the date of each investment, the repayment date, and the amount repaid from transmission revenues. *Bonneville Power Admin.*, 26 FERC ¶ 61,096 (1984).

The Commission approved BPA's methodology for separate repayment studies in 1984. *Bonneville Power Admin.*, 28 FERC ¶ 61,325 (1984). Thus, BPA has prepared separate repayment studies for its transmission and generation functions since 1984. This standard has enabled BPA to set power and transmission rates separately with minimal change in repayment policy and the process for developing each revenue requirement. This study incorporates the repayment study for only the generation function for FY 2016–2017.

1.2.2.2 Repayment Schedules

The statutes applicable to BPA do not include specific directives for scheduling repayment of capital appropriations and bonds issued to Treasury other than a directive that the Federal investment be amortized over a reasonable period of years. BPA's repayment policy has been established largely through administrative interpretation of its statutory requirements.

There have been a number of changes in BPA's repayment policy over the years concurrent with expansion of the Federal system and changing conditions. In general, current repayment criteria were approved by the Secretary of the Interior on April 3, 1963. These criteria were refined and submitted to the Secretary and the Federal Power Commission (the predecessor agency to the Federal Energy Regulatory Commission) in support of BPA's rate filing in September 1965. The repayment policy was presented to Congress for its consideration for the authorization of the Grand Coulee Dam Third Powerhouse in June 1966. The underlying theory of repayment was discussed in the House of Representatives' Report related to authorization of this project, H.R. Rep. No. 89-1409, 2d Sess., at 9-10 (1966). As stated in that report:

> Accordingly, [in a repayment study] there is no annual schedule of capital repayment. The test of the sufficiency of revenues is whether the capital investment can be repaid within the overall repayment period established for each power project, each increment of investment in the transmission system, and each block of irrigation assistance. Hence, repayment may proceed at a faster or slower pace from year-to-year as conditions change ….

> This approach to repayment scheduling has the effect of averaging the year-to-year variations in costs and revenues over the repayment period. This results in a uniform cost per unit of power sold, and permits the maintenance of stable rates for extended periods. It also facilitates the orderly marketing of power and permits Bonneville Power Administration customers, which include both electric utilities and electroprocess industries, to plan for the future with assurance.

The Secretary of the Interior issued a statement of power policy on September 30, 1970, setting forth general principles that reaffirmed the repayment policy as previously developed. The most pertinent of these principles were set forth in the Department of the Interior Manual, Part 730, Chapter 1:

> A. Hydroelectric power, although not a primary objective, will be proposed to Congress and supported for inclusion in multiple-purpose Federal projects when … it is capable of repaying its share of the Federal investment, including operation and maintenance costs and interest, in accordance with the law.
>
> B. Electric power generated at Federal projects will be marketed at the lowest rates consistent with sound financial management. Rates for the sale of Federal electric power will be reviewed periodically to assure their sufficiency to repay operating and maintenance costs and the capital investment within 50 years with interest that more accurately reflects the cost of money.

To achieve a greater degree of uniformity in repayment policy for all Federal power marketing administrations, the Deputy Assistant Secretary of the Department of the Interior (DOI) issued a memo on August 2, 1972, outlining (1) a uniform definition of the start of the repayment period for a particular project; (2) the method for including future replacement costs in repayment studies; and (3) a provision that the investment or obligation bearing the highest interest rate shall be amortized first, to the extent possible, while ensuring that BPA still complies with the prescribed repayment period established for each increment of investment.

A further clarification of the repayment policy was outlined in a joint memo of January 7, 1974, from the Assistant Secretary for Reclamation and Assistant Secretary for Energy and Minerals. This memo states that in addition to meeting the overall objective of repaying the Federal investment and obligations within the prescribed repayment periods, revenues shall be adequate, except in unusual circumstances, to repay annually all costs for O&M, purchased power, and interest.

On March 22, 1976, the DOI issued Chapter 4 of Part 730 of the DOI Manual to codify financial reporting requirements for the Federal power marketing agencies; it describes standard policies and procedures for preparing system repayment studies.

BPA and other Federal power marketing agencies were transferred to the newly established Department of Energy on October 1, 1977. DOE Organization Act, 42 U.S.C. § 7101 *et seq.* (1994). The DOE adopted the policies set forth in Part 730 of the DOI Manual by issuing Interim Management Directive No. 1701 on September 28, 1977, which subsequently was replaced by RA 6120.2, issued on September 20, 1979, and amended on October 1, 1983.

The repayment policy outlined in DOE Order RA 6120.2, paragraph 12, provides that BPA's total revenues from all sources must be sufficient to

(1) Pay all annual costs of operating and maintaining the Federal power system;

(2) Pay the cost of obtaining power through purchase and exchange agreements, the cost for transmission services, and other costs during the year in which such costs are incurred;

(3) Pay interest each year on the unamortized portion of the commercial power investment financed with appropriated funds at the interest rates established for each generating project and for each annual increment of such investment in the BPA transmission system, except that recovery of annual interest expense may be deferred in unusual circumstances for short periods of time;

(4) Pay when due the interest and amortization portion on outstanding bonds sold to the U.S. Treasury;

(5) Repay:

- each dollar of power investments and obligations in the FCRPS generating projects within 50 years after the projects become revenue-producing (50 years has been deemed a "reasonable period" as intended by Congress, except for the Yakima-Chandler Project, which has a legislated amortization period of 66 years);
- each annual increment of transmission financed by Federal investments and obligations within the average service life of such transmission facilities (currently 40 years) or within a maximum of 50 years, whichever is less [BPA has interpreted RA 6120.2 to require repayment of bonds for fish and wildlife facilities to be within 15 years];
- the Federally-financed amount of each replacement within its service life up to a maximum of 50 years; and

(6) As required by Pub.L. No. 89-448, repay the portion of construction costs at Federal reclamation projects that is beyond the repayment ability of the irrigators, and which is assigned for repayment from commercial power

revenues, within the same overall period available to the irrigation water users for making their payments on construction costs.

The typical repayment period for appropriated capital investments for generation is 50 years from the year in which the plant is placed in service. Appropriated transmission investments have due dates set at no more than 45 years. The Refinancing Act (see section 1.2.1.2) overrides provisions in DOE Order RA 6120.2 related to determining interest during construction and assigning interest rates to Federal investments financed by appropriations. This Act also contains provisions on repayment periods (due dates) for the refinanced investments.

Other sections within DOE Order RA 6120.2 require that any outstanding deferred interest payments must be repaid before any planned amortization payments are made. Also, repayments are to be made by amortizing those Federal investments and obligations bearing the highest interest rate first, to the extent possible, while ensuring that BPA still completes repayment of each increment of Federal investment and obligation within its prescribed repayment period.

The generation function is also charged with recovering irrigation assistance costs. Irrigation costs are repaid without interest. Pub.L. No. 89-448 authorizes the payment of irrigation costs from revenues of the entire power system and as such are functionalized to generation. This is consistent with the so-called "Basin Account" concept. Pub.L. No. 89-561, approved on September 7, 1966, amended Pub.L. No. 89-448 to provide several limitations on the repayment of irrigation costs from power revenues. These limitations are:

(1) the irrigation costs are to be paid from "net revenues" of the power system, with net revenues defined as those revenues over and above the amount needed to cover power costs and previously authorized irrigation payments;

(2) the construction of new Federal irrigation projects will be scheduled; *i.e.,* deferred, if necessary, so that the repayment of the irrigation costs from power revenues will not require an increase in the BPA power rate level; and

(3) the total amount of irrigation costs to be repaid from power revenues shall not average more than $30 million per year in any period of 20 consecutive years.

2. DEVELOPMENT OF THE GENERATION REVENUE REQUIREMENT

2.1 Spending Level Development

The development of program spending levels occurs outside the rate process. For the FY 2016–2017 rate period it began in February and March of 2014, when BPA hosted the 2014 Capital Investment Review (CIR), a public process focused on reviewing and discussing draft asset strategies and 10-year capital forecasts. It continued with the 2014 Integrated Program Review (IPR), which provides customers and constituents an opportunity to examine, understand, and comment on BPA's cost projections for BPA's power and transmission functions.

BPA began the 2014 IPR discussion in May 2014 with the release of the IPR initial report and an opening workshop on May 28 presenting an overview of Power, Transmission, and corporate agency services proposed expense spending levels for FY 2015–2017 (the cost evaluation period). The initial report and workshop discussed proposed expense spending levels, particularly for the FY 2016–2017 rate period; the drivers, goals, and risks associated with the proposed expense spending levels; and comparisons to previous IPR costs. The initial report also included capital cost projections for FY 2016–2017, informed by the CIR process. After the opening IPR workshop and release of information, participants were allowed ten days to request additional information or specific workshop topics.

BPA responded to requests for additional information and held three days of workshops in June 2014 to discuss the projected spending levels of many program areas including the Columbia Generating Station (CGS); Corps; Reclamation; BPA's energy efficiency, transmission and fish and wildlife programs; and BPA's Information Technology program. While debt management actions are outside the scope of the IPR, workshops were held to enhance participants' understanding of the implications of past debt management decisions, proposed capital spending, and potential debt management tools. After considering the comments received, BPA released a final IPR close-out report in October 2014.

BPA initiated an update to the IPR in February 2015. The IPR 2 process focused on transitioning the funding of the energy efficiency investment program from capital to expense. Starting in FY 2016, BPA will no longer borrow for energy efficiency investments and will instead treat them as an expense program.

This study incorporates the spending levels identified in the 2014 IPR final close-out report and the 2015 IPR 2 close-out report, which can be found on BPA's public Web site: Finance & Rates—Financial Public Processes—Integrated Program Review.

2.2 Capital Funding

The forecast of BPA's capital investments for FY 2016–2017 used in setting the BP-16 power rates was produced in the IPR. The following section describes the forecasts developed in the CIR, recognizing that timing of some planned capital spending may be stretched into the following rate period. FCRPS capital investments include Corps, Reclamation, and BPA capital investments and third-party resource investments for which debt is secured by BPA (capitalized contracts). Projections of current FCRPS capital outlays total $1.05 billion for the FY 2016–2017 rate period. These investments include:

- improvements and maintenance needed to increase reliability, safety, and performance at the CGS nuclear plant
- improvements and maintenance needed to improve reliability of the aging and deteriorating Federal hydro system
- investment in fish and wildlife mitigation measures
- investment in capital equipment

Table 3 provides investment projections for the rate period. This study projects that no capital investments will be funded from current revenues.

2.2.1 Bonds Issued to the U.S. Treasury

Bonds issued to the U.S. Treasury are the source of capital that will be used to finance BPA's FY 2016–2017 capital program and Corps and Reclamation investments that BPA has agreed to direct-fund under section 2406 of Pub.L. No. 102-486, 16 U.S.C. § 839d-1. These expenditures include a total capital projection of $814 million, which is comprised of BPA Fish and Wildlife direct program investments ($84 million), BPA capital equipment ($28.5 million), and generating resource investments of the Corps and Reclamation ($511 million) during FY 2016–2017. *See* Table 3.

Interest rates on bonds BPA issues to the U.S. Treasury are set at market interest rates comparable to interest rates on securities issued by other agencies of the U.S. Government. Interest rates on bonds projected to be issued are included in Chapter 6 of the Power Revenue Requirement Documentation, BP-16-FS-BPA-02A.

2.2.2 Federal Appropriations

In general, the study reflects that all Corps and Reclamation capital investments in the FCRPS will be financed by Federal appropriations unless they are direct-funded by BPA. This study includes projected appropriated investments totaling $157 million during the rate period for Corps fish and wildlife mitigation and recovery measures through the Columbia River Fish Mitigation (CRFM) project. No other appropriations-financed investments are forecast for the rate period. Capital investments funded by this source do not become BPA's obligation to repay until they are placed in service.

The interest rate forecast for appropriated capital investments expected to be placed in service is found in Chapter 6 of the Power Revenue Requirement Documentation, BP-16-FS-BPA-02A. Each new capital investment is assigned a rate from the U.S. Treasury yield curve prevailing in the month prior to the beginning of the fiscal year in which the new investment is placed in service.

To determine interest during construction for new capital investments for a given fiscal year, the prevailing U.S. Treasury one-year rate for each fiscal year of construction is applied to the sum of the cumulative expenditures made and interest during construction that has accrued prior to the end of the fiscal year. *See* Power Revenue Requirement Documentation, BP-16-FS-BPA-02A, Ch. 6.

2.2.3 Third-Party Debt

Third-party debt differs from U.S. Treasury debt in that entities other than BPA or the U.S. Treasury issue the debt. BPA's promise to make payments serves as security for bonds or other debt that the third party issues, resulting in wider market access and potentially more favorable interest rates for the seller. Examples of acquisitions financed in this way include the Energy Northwest, Inc. (EN) WNP-1, WNP-3, and CGS nuclear power projects and the Lewis County Public Utility District Hydroelectric Project (Cowlitz Falls). This study does not include forecasts of non-Federal debt transactions during the cost evaluation period.

This study does include an undistributed reduction representing the estimated net revenue requirement effect if BPA and EN were to refinance WNP-1 and WNP-3 debt that is due in 2015–2018 and instead repay higher-interest-rate Federal appropriations. These transactions are uncertain and are not included as modeling assumptions in the rate case. Instead, BPA has estimated the effect such transactions would have on capital-related costs and included that effect as an undistributed reduction. *See* Power Revenue Requirement Documentation, BP-16-FS-BPA-02A, Tables 3H and 3I.

2.2.4 Prepayment Program

The prepayment program involves customers prepaying future power bills by purchasing blocks of revenue credits that would be applied to billings through FY 2028, when the current Regional Dialogue contracts expire. Four customers chose to participate in the program, prepaying revenues of $340 million. The use of these funds began in FY 2013. These funds will be used to finance Corps and Reclamation capital investment in lieu of borrowing from the U.S. Treasury.

2.3 Debt Optimization Program

After base power rates were filed for the FY 2002–2006 rate period, BPA instituted a Debt Optimization Program (DOP) with EN as a means of replenishing Treasury borrowing authority. Debt Optimization (DO) involves extending EN debt that has come due and using the cash flows that would have gone to pay the EN debt to repay an equivalent amount of Federal debt. The program has resulted in a considerable amount of Federal debt, primarily bonds issued to Treasury but also some Congressional appropriations, being paid well in advance of the amortization schedules established in the WP-02 rate filing. As the program continued during FY 2007–2009, additional advance amortization was created, compared to the schedules that would have been established without DO, for the subsequent rate periods through FY 2012. Effectively, the extension of EN debt into FY 2013–2018 has advanced the repayment of Federal debt relative to the amount that otherwise would have been paid in that period. BPA has committed to EN that it would follow this program, matching dollar for dollar the repayment of Federal obligations in the same year in which EN debt has been extended, absent dire financial circumstances that might cause some delay in the payment of the advanced portion of the amortization.

This study includes EN debt optimization transactions completed through FY 2009. BPA has ended the DO program, and no forecasts of DO actions are included in the proposed rates.

2.4 Modeling of BPA's Repayment Obligations

Repayment studies are performed as part of the process for determining revenue requirements. The studies establish a schedule of annual U.S. Treasury amortization for the rate period and the resulting interest payments. Each repayment study covers a rate test year and the ensuing repayment period, which extends to the last year by which all outstanding and projected obligations must be repaid. For generation repayment studies, that period is 50 years.

In conducting the repayment studies, BPA includes as fixed inputs the annual debt service payments associated with its capitalized contract obligations and the fixed annual payments associated with long-term energy resource acquisition contracts. All outstanding and projected generation repayment obligations for appropriated investments (including irrigation assistance) and bonds issued to the U.S. Treasury are included to be scheduled for repayment. Funding for replacements projected during the repayment period is also included in the repayment study, consistent with the requirements of RA 6120.2.

Appropriations and bonds are scheduled to be repaid within the expected useful life of the associated facility or 50 years, whichever is less. Corps and Reclamation project replacements funded by appropriations and placed in service in 1994 or later have repayment periods that are set at the weighted average service life of all replacements going into service at that project in that year.

Bonds issued by BPA to the U.S. Treasury have varying terms, taking into account the estimated average service lives for investments and prudent financing and cash management factors.

Generally, bonds are issued with a provision that allows them to be called after a certain time. Bonds may also be issued with no early call provision. Early retirement of eligible bonds may require that BPA pay a bond premium to the U.S. Treasury. Bonds may also be called and repaid at a discount. In addition, the interest rate that BPA pays on callable bonds is higher than the interest rate on non-callable bonds issued at the same time.

Bonds are issued to finance BPA's Fish and Wildlife Program and Corps and Reclamation investments that are direct-funded by BPA. These bonds are repaid within the terms and conditions of each bond issued to the U.S. Treasury. Bonds to finance fish and wildlife capital investments are issued with maturities not to exceed 15 years, the same period over which BPA amortizes these capital investments. Corps and Reclamation direct-funding bonds are issued with maturities not to exceed 30 years, although they can be refinanced within the 50-year repayment period.

Based on these parameters, the repayment study establishes a schedule of planned amortization payments and resulting interest expense by determining the lowest levelized debt service stream necessary to repay all generation obligations within the required repayment period.

For further discussion of the repayment program, see the Power Revenue Requirement Study Documentation, BP-16-FS-BPA-02A, Ch. 13.

2.5 Products Used by Other Studies

This study produces information that is used in other studies. The information provided to the Rate Analysis Model (RAM) includes itemized program spending data; the allocation of net interest, MRNR, and PNRR to cost pools; and the allocation of interest income between the Composite cost pool and the Non-Slice cost pool.

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3. GENERATION REVENUE REQUIREMENT

3.1 Revenue Requirement

For each year of a rate period, BPA prepares two tables that constitute the process by which the revenue requirement is determined. The Income Statement includes projections of Total Expenses, PNRR, and if necessary, an MRNR component. The Statement of Cash Flow shows the analysis used to determine MRNR and the cash available for risk mitigation.

The Income Statement, Table 4, displays the components of the annual revenue requirement, which includes Total Operating Expenses (line 19), Net Interest Expense (line 30), and Total Planned Net Revenues (line 36), which consists of MRNR (line 34) and PNRR (line 35). The sum of these three major components is the Total Revenue Requirement (line 38).

The amounts shown in Total Operating Expenses are primarily established outside the ratesetting process in the IPR. Other expenses, such as power purchases, augmentation, transmission acquisition and ancillary services, and net interest, are modeled within the rate case. The MRNR (line 34) results from an analysis of the Statement of Cash Flow, Table 5. MRNR may be necessary to ensure that revenue requirements are sufficient to cover all cash requirements, including annual amortization of the Federal investment as determined in the power repayment studies, and any other cash requirements, such as irrigation assistance payments.

The Statement of Cash Flow (Table 5) analyzes annual cash inflow and outflow. Cash provided by Operating Activities (line 9), driven by the Non-Cash Items shown in lines 4, 5, 6, and 7, must be sufficient to compensate for the difference between Cash Used for Investment Activities (line 16) and Cash Provided by Borrowing and Appropriations (line 25). If cash provided by current operations is not sufficient, MRNR must be included in revenue requirements to accommodate the shortfall, yielding at least zero Annual Increase in Cash (line 27). Any MRNR amounts shown on the Statement of Cash Flow (line 2) are then incorporated in the Income Statement (Table 4, line 34).

3.2 Current Revenue Test

Consistent with DOE Order RA 6120.2, the continuing adequacy of existing rates must be tested annually. The current revenue test, exhibited in Tables 6 and 7, determines whether the revenue expected from current rates will meet cost recovery requirements during the FY 2016–2017 rate period and the ensuing repayment period. Revenue at current rates can be found in the Power Rates Study (PRS) Documentation, BP-16-FS-BPA-01A, § 4.1.

The result of the current revenue test demonstrates that projected revenue from current rates is inadequate to meet the cost recovery criteria of Order RA 6120.2 over the repayment period, because the net position is negative. *See* Table 8, column K. If revenues from current rates were adequate, current rates could be extended, although other reasons may exist for revising rates, such as the implementation of a new rate design.

3.3 Revised Revenue Test

Consistent with DOE Order RA 6120.2, the adequacy of proposed rates must be demonstrated. The revised revenue test determines whether the revenue projected from proposed rates will meet cost recovery requirements for the rate period. The revised revenue test is conducted using the forecast of revenue under proposed rates. PRS Documentation, BP-16-FS-BPA-01A, § 4.2.

For the rate period, the demonstration of the adequacy of proposed rates is shown in Tables 9 and 10. Table 10 tests the sufficiency of the resulting net revenues from Table 9 (line 35) for making the planned annual amortization and irrigation assistance payments. The sufficiency of net revenues is demonstrated by the annual increase (decrease) in cash (Table 10, line 27). The annual cash flow must be at least zero to demonstrate the adequacy of the projected revenues to cover all cash requirements.

The results of the revised revenue test demonstrate that proposed rates are adequate to fulfill the basic cost recovery requirements for the rate period, FY 2016–2017. With the successful test of proposed rates, the rate development process ends.

3.4 Repayment Test at Proposed Rates

Table 11, Generation Revenue from Proposed Rates, demonstrates whether projected revenue from proposed rates is adequate to meet the cost recovery criteria of DOE Order RA 6120.2 over the repayment period. The data are presented in a format consistent with the revised revenue tests, Tables 9 and 10, and the separate accounting analysis that is an attachment to the filing with the Commission. The focal point of these tables is the net position (column K), which is the amount of funds provided by revenues that remain after meeting annual expenses requiring cash for the rate period and repayment of the Federal investment. Thus, if the net position is zero or greater in each of the years of the rate period through the repayment period, the projected revenues demonstrate BPA's ability to repay the Federal investment in the FCRPS within the allowable time. As shown in column K, the resulting net position is zero or greater for each year of the rate period and in each year of the repayment period.

The historical data on this table have been taken from BPA's separate accounting analysis. The rate period data have been developed specifically for this study. The repayment period data are presented consistent with the requirements of RA 6120.2. Typically, the test of revenue sufficiency through the repayment period uses expenses from the last year of the rate period. As has been done since the WP-07 rate proceeding, for the FY 2016–2017 rates expenses for the

CGS nuclear plant are normalized, because it is on a two-year refueling cycle, which results in low costs in the first year and high costs in the second year. FY 2017 is a refueling year for CGS, which increases O&M costs for the facility and power purchase costs to make up for the loss of generation during the refueling. The projection of these outage costs in every year of the repayment period would misrepresent the costs associated with the CGS refueling cycle. For the purposes of this revenue test, these CGS costs for FY 2016 and FY 2017 have been averaged to produce an average annual cost for the operation of CGS for the rate period. Augmentation purchases are also averaged in this fashion because of the higher costs in FY 2017 to make up for lost CGS generation.

Table 12, Amortization of Generation Investments Over Repayment Period, summarizes the amortization of Federal investments over the repayment period. It displays the total investment costs through the cost evaluation period, forecast replacements required to maintain the system through the repayment period, the cumulative dollar amount of investment placed in service, scheduled amortization payments for each year of the repayment period (due and discretionary), unamortized investments including replacements through the repayment period, unamortized obligations as determined by a term schedule (if all obligations were paid at maturity and never early), and the predetermined amortization payments and the unamortized amount of irrigation assistance for each year of the repayment period.

TABLES

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Table 1: Projected Net Revenues from Proposed Rates
($000s)

		A		B		C	
		FY 2016		FY 2017		Average	
1	Projected Revenues from Proposed Rates	$	2,847,676	$	2,874,596	$	2,861,136
2	Projected Expenses		2,805,405		2,915,411		2,860,408
3	Net Revenues	$	42,271	$	(40,815)	$	728

Table 2: Planned Federal Amortization & Irrigation Assistance Payments
($000s)

		A	B	C	D
		Bond	Appropriations	Irrigation	
	Fiscal Year	Amortization	Amortization	Assistance	Total
1	2016	$10,500	$84,197	$61,066	$155,763
2	2017	35,150	74,279	51,482	160,911
3	Total	$45,650	$158,476	$112,548	$316,674

Table 3: Projected Capital Funding Requirements for the FCRPS

($000s)

		A FY 2016	B FY 2017
	POWER		
	Capital Requirements for Revenue Producing Investments		
1	Corps & Reclamation Additions/Replacements - Direct Funded	240,000	266,000
2	Power Services Capital Equipment	10,000	8,000
3	CGS: Additions/Replacements	118,100	143,600
4	**Annual Capital Requirements for Revenue Producing Investments**	**368,100**	**417,600**
	Capital Requirements for Non-Revenue Producing and Public Benefit Investments		
5	**Energy Conservation**	Expensed starting in FY 2016	
6	**Fish Investment**		
7	BPA Fish and Wildlife Investment	55,000	31,000
8	Corps & Reclamation Fish Investment - Appropriations	52,350	129,450
9	**Total Fish Investment**	107,350	160,450
10	Other Third-Party	-	-
11	**Annual Capital Req. for Non-Rev. & Public Benefit Invests.**	**107,350**	**160,450**
12	**ANNUAL FUNDING REQUIREMENTS FOR POWER**	**475,450**	**578,050**
13	**CUMULATIVE FUNDING REQUIREMENTS FOR POWER**	**475,450**	**1,053,500**

Table 4: Generation Revenue Requirement Income Statement
($000s)

				A	B
			($000s)	2016	2017
1	OPERATING EXPENSES				
2		POWER SYSTEM GENERATION RESOURCES			
3			OPERATING GENERATION RESOURCES	685,954	748,609
4			OPERATING GENERATION SETTLEMENT PAYMENTS	19,323	19,651
5			NON-OPERATING GENERATION	1,600	1,863
6			CONTRACTED POWER PURCHASES	48,400	81,843
7			AUGMENTATION POWER PURCHASES	0	20,947
8			EXCHANGES & SETTLEMENTS	295,513	295,540
9			RENEWABLE GENERATION	40,987	41,641
10			GENERATION CONSERVATION	136,649	131,665
11		POWER NON-GENERATION OPERATIONS		96,542	99,836
12		PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES		186,998	195,831
13		F&W/USF&W/PLANNING COUNCIL		310,539	318,395
14		GENERAL AND ADMINISTRATIVE/SHARED SERVICES		72,281	74,646
15		OTHER INCOME, EXPENSES AND ADJUSTMENTS		(97,577)	(129,463)
16		NON-FEDERAL DEBT SERVICE		594,308	594,839
17		DEPRECIATION		140,201	143,468
18		AMORTIZATION		82,350	85,034
19	TOTAL OPERATING EXPENSES			2,614,069	2,724,346
20					
21	INTEREST EXPENSE:				
22		INTEREST			
23			APPROPRIATED FUNDS	189,757	186,051
24			CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
25			BONDS ISSUED TO U.S. TREASURY	56,935	69,299
26			AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
27			NON-FEDERAL INTEREST	13,273	12,469
28		ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION		(10,731)	(11,360)
29		INTEREST CREDIT ON CASH RESERVES		(11,542)	(18,320)
30	NET INTEREST EXPENSE			191,755	192,202
31					
32	TOTAL EXPENSES			2,805,824	2,916,547
33					
34	MINIMUM REQUIRED NET REVENUE 1/			0	0
35	PLANNED NET REVENUE FOR RISK			0	0
36	PLANNED NET REVENUE, TOTAL (30+31)			0	0
37					
38	**TOTAL REVENUE REQUIREMENT**			**2,805,824**	**2,916,548**
1/	SEE NOTE ON CASH FLOW STATEMENT				

Table 5: Generation Revenue Requirement Statement of Cash Flow

($000s)

		A	B
	($000s)	2016	2017
1	CASH FROM OPERATING ACTIVITIES		
2	MINIMUM REQUIRED NET REVENUE 1/	0	0
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	13,273	12,469
5	DEPRECIATION AND AMORTIZATION	222,551	228,502
6	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
7	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
8	NON-CASH REVENUES	(34,124)	(34,124)
9	CASH PROVIDED BY OPERATING ACTIVITIES	155,763	160,911
10			
11	CASH FROM INVESTMENT ACTIVITIES		
12	INVESTMENT IN:		
13	UTILITY PLANT (INCLUDING AFUDC)	(211,153)	(403,151)
14	ENERGY EFFICIENCY	0	0
15	FISH & WILDLIFE	(55,000)	(50,000)
16	CASH USED FOR INVESTMENT ACTIVITIES	(266,153)	(453,151)
17			
18	CASH FROM BORROWING AND APPROPRIATIONS:		
19	INCREASE IN BONDS ISSUED TO U.S. TREASURY	150,494	323,700
20	REPAYMENT OF BONDS ISSUED TO U.S. TREASURY	(10,500)	(35,150)
21	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	52,353	129,451
22	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(84,197)	(74,279)
23	CUSTOMER PROCEEDS	63,306	0
24	PAYMENT OF IRRIGATION ASSISTANCE	(61,066)	(51,482)
25	CASH PROVIDED BY BORROWING AND APPROPRIATIONS	110,390	292,241
26			
27	ANNUAL INCREASE (DECREASE) IN CASH	0	0
28			
29	PLANNED NET REVENUE FOR RISK	0	0
30			
31	TOTAL ANNUAL INCREASE (DECREASE) IN CASH	0	0
1/	Minimum required net revenues are added to ensure suffcient cash flow is available		
	to repay the federal investment.		

Table 6: Generation Current Revenue Test Income Statement

($000s)

		A	B
		2016	2017
1	REVENUES FROM CURRENT RATES	2,748,485	2,775,436
2	OPERATING EXPENSES		
3	POWER SYSTEM GENERATION RESOURCES		
4	OPERATING GENERATION	685,954	748,609
5	OPERATING GENERATION SETTLEMENTS	19,323	19,651
6	NON-OPERATING GENERATION	1,600	1,863
7	CONTRACTED POWER PURCHASES	48,400	81,843
8	AUGMENTATION POWER PURCHASES	0	20,947
9	EXCHANGES & SETTLEMENTS	295,513	295,540
10	RENEWABLE GENERATION	40,987	41,641
11	GENERATION CONSERVATION	136,649	131,665
13	POWER NON-GENERATION OPERATIONS	96,542	99,836
14	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	186,998	195,831
15	F&W/USF&W/PLANNING COUNCIL	310,539	318,395
16	BPA INTERNAL SUPPORT	72,281	74,646
17	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(97,577)	(129,463)
18	NON-FEDERAL DEBT SERVICE	594,308	594,839
19	DEPRECIATION	140,201	143,468
20	AMORTIZATION	82,350	85,034
21	TOTAL OPERATING EXPENSES	2,614,069	2,724,346
22	INTEREST EXPENSE		
23	INTEREST		
24	APPROPRIATED FUNDS	189,757	186,051
25	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
26	BONDS ISSUED TO U.S. TREASURY	56,935	69,299
27	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
	NON-FEDERAL INTEREST	13,273	12,469
28	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(10,731)	(11,360)
29	INTEREST CREDIT ON CASH RESERVES	(11,227)	(15,449)
30	NET INTEREST EXPENSE	192,070	195,072
31	TOTAL EXPENSES	2,806,139	2,919,418
32	NET REVENUES	(57,654)	(143,982)

Table 7: Generation Current Revenue Test Statement of Cash Flow

($000s)

		A	B
		2016	2017
1	CASH PROVIDED BY OPERATING ACTIVITIES		
2	NET REVENUES	(57,654)	(143,982)
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	13,273	12,469
5	DEPRECIATION AND AMORTIZATION	222,551	228,502
6	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
7	NON-CASH REVENUES	(34,124)	(34,124)
8	CASH FLOW ADJUSTMENT (RESERVE)/APPLICATION	0	0
9	CASH PROVIDED BY OPERATING ACTIVITIES	98,109	16,928
10			
11	CASH USED FOR INVESTMENT ACTIVITIES		
12	INVESTMENT IN:		
13	FEDERAL UTILITY PLANT (INCLUDING AFUDC)	(211,153)	(403,151)
14	CONSERVATION	0	0
15	FISH & WILDLIFE	(55,000)	(50,000)
16	CASH USED FOR INVESTMENT ACTIVITIES	(266,153)	(453,151)
17			
18	CASH FROM (AND USED FOR) FINANCING ACTIVITIES		
19	INCREASE IN TREASURY DEBT	150,494	323,700
20	CUSTOMER PROCEEDS	63,306	0
21	REPAYMENT OF TREASURY DEBT	(10,500)	(35,150)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	52,353	129,451
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(84,197)	(74,279)
24	PAYMENT OF IRRIGATION ASSISTANCE	(61,066)	(51,482)
25	CASH USED FOR FINANCING ACTIVITIES	110,390	292,241
26			
27	ANNUAL INCREASE (DECREASE) IN CASH	(57,654)	(143,982)

Table 8:   Generation Revenue from Current Rates – Results Through the Repayment Period

($000s)

		A	B	C	D	E	F	G	H	I	J	K
	YEAR COMBINED CUMULATIVE	REVENUES (STATEMENT A)	OPERATION & MAINTENANCE (STATEMENT E)	PURCHASE AND EXCHANGE POWER (STATEMENT E)	DEPRECIATION	NET INTEREST (STATEMENT D)	NET REVENUES (F=A-B-C-D-E)	NONCASH EXPENSES 1/ (COLUMN D)	FUNDS FROM OPERATION 2/ (H=F+G)	AMORTIZATION (REV REQ STUDY DOCUMENTATION)	IRRIGATION AMORTIZATION (STATEMENT C)	NET POSITION (K=H-I-J)
1	**2002**	53,734,071	8,765,016	36,248,938	3,428,034	5,499,734	(207,651)	3,436,330	3,199,127	2,754,877	41,703	402,547
2												
3	**GENERATION**											
4	**2003**	3,144,811	705,289	1,841,035	178,896	176,595	242,996	131,592	314,144	73,000		241,144
5	**2004**	2,738,898	713,549	1,366,265	177,298	162,531	319,255	129,789	354,413	233,000	739	120,674
6	**2005**	2,814,224	711,713	1,420,735	186,099	166,610	329,067	(98,072)	320,734	271,301		49,433
7	**2006**	2,853,659	773,510	1,436,548	181,878	157,609	304,114	(84,357)	537,237	261,276		275,961
8	**2007**	2,657,891	818,494	1,361,837	176,204	145,516	155,840	133,875	289,715	246,300		43,415
9	**2008**	2,383,688	802,849	1,224,722	183,466	142,746	29,905	28,438	195,087	277,483	2,950	(85,346)
10	**2009**	2,234,695	871,705	1,265,997	180,788	151,508	(235,303)	166,189	(69,114)	219,360		(288,474)
11	**2010**	2,385,607	883,540	1,393,796	184,989	176,928	(253,646)	120,913	(132,733)	244,673		(377,406)
12	**2011**	2,619,038	934,466	1,283,304	201,106	182,860	17,302	155,354	169,132	162,163		6,969
13	**2012**	2,631,334	962,711	1,260,404	199,286	169,748	39,185	153,534	174,395	193,000	1,182	(19,787)
14	**2013**	2,647,095	1,011,463	1,260,527	218,103	207,798	(50,796)	164,704	110,384	122,799	58,823	(71,238)
15	**2014**	2,810,919	1,017,269	896,127	227,267	196,361	473,895	143,049	596,116	462,575	52,547	80,994
16												
17	**COST EVALUATION**											
18	**PERIOD**											
19	**2015**	2,681,151	1,053,332	828,829	230,228	199,746	369,016	184,291	503,358	570,319	52,204	(119,165)
20												
21	**RATE APPROVAL**											
22	**PERIOD**											
23	**2016**	2,748,485	1,125,459	1,266,059	222,551	192,070	(57,654)	189,887	98,109	94,697	61,066	(57,654)
24	**2017**	2,775,436	1,119,664	1,376,180	228,502	195,072	(143,982)	195,034	16,928	109,429	51,482	(143,982)
25												
26	**REPAYMENT**											
27	**PERIOD**											
28	**2018**	2,775,436	1,119,664	1,330,049	228,502	206,186	(108,964)	195,034	51,946	109,904	27,612	(85,570)
29	**2019**	2,775,436	1,119,664	1,086,913	228,502	203,198	137,158	195,034	298,069	325,441	57,317	(84,690)
30	**2020**	2,775,436	1,119,664	1,133,352	228,502	204,401	89,517	195,034	250,427	309,557	24,639	(83,769)
31	**2021**	2,775,436	1,119,664	1,113,497	228,502	204,187	109,585	195,034	270,496	341,051	12,250	(82,805)
32	**2022**	2,775,436	1,119,664	1,119,483	228,502	199,684	108,103	195,034	269,013	336,393	14,417	(81,797)
33	**2023**	2,775,436	1,119,664	1,117,101	228,502	189,394	120,774	195,034	281,685	349,437	12,989	(80,741)
34	**2024**	2,775,436	1,119,664	1,069,647	228,502	182,703	174,920	195,034	335,830	400,236	15,231	(79,637)
35	**2025**	2,775,436	1,119,664	916,353	228,502	170,273	340,644	195,034	501,555	566,311	13,725	(78,481)
36	**2026**	2,775,436	1,119,664	921,136	228,502	142,037	364,097	195,034	525,007	581,335	20,944	(77,272)
37	**2027**	2,775,436	1,119,664	945,083	228,502	121,336	360,851	195,034	521,761	591,592	6,176	(76,007)
38	**2028**	2,775,436	1,119,664	983,635	228,502	107,985	335,650	195,034	496,560	559,954	11,288	(74,683)
39	**2029**	2,775,436	1,119,664	949,771	228,502	103,209	374,289	195,034	535,200	607,015	4,065	(75,880)
40	**2030**	2,775,436	1,119,664	880,143	228,502	60,996	486,131	195,034	647,041	719,682	1,996	(74,636)
41	**2031**	2,775,436	1,119,664	860,325	228,502	56,749	510,196	195,034	671,106	734,371	10,678	(73,943)
42	**2032**	2,775,436	1,119,664	807,380	228,502	28,096	591,793	195,034	752,704	826,646	-	(73,943)
43	**2033**	2,775,436	1,119,664	777,750	228,502	(4,124)	653,645	195,034	814,555	884,151	4,347	(73,943)
44	**2034**	2,775,436	1,119,664	782,683	228,502	(36,545)	681,132	195,034	842,042	851,590	-	(9,547)
45	**2035**	2,775,436	1,119,664	782,701	228,502	(52,468)	697,037	195,034	857,947	240,144	7,875	609,928
46	**2036**	2,775,436	1,119,664	782,765	228,502	(52,467)	696,972	195,034	857,882	240,144	28,920	588,818
47	**2037**	2,775,436	1,119,664	782,123	228,502	(52,476)	697,623	195,034	858,534	240,144	16,078	602,312
48	**2038**	2,775,436	1,119,664	772,100	228,502	(52,610)	707,780	195,034	868,690	240,144	-	628,546
49	**2039**	2,775,436	1,119,664	739,867	228,502	(53,040)	740,443	195,034	901,354	240,144	14,181	647,028
50	**2040**	2,775,436	1,119,664	737,557	228,502	(53,071)	742,783	195,034	903,694	240,144	-	663,550
51	**2041**	2,775,436	1,119,664	730,624	228,502	(53,164)	749,809	195,034	910,720	240,144	-	670,576
52	**2042**	2,775,436	1,119,664	730,623	228,502	(53,164)	749,810	195,034	910,721	240,144	73,659	596,918
53	**2043**	2,775,436	1,119,664	730,621	228,502	(53,164)	749,813	195,034	910,723	240,144	-	670,579
54	**2044**	2,775,436	1,119,664	852,880	228,502	(51,531)	625,922	195,034	786,832	240,144	-	546,688
55	**2045**	2,775,436	1,119,664	1,216,813	228,502	(46,673)	257,130	195,034	418,040	240,144	11,749	166,148
56	**2046**	2,775,436	1,119,664	1,216,812	228,502	(46,673)	257,131	195,034	418,041	240,144	-	177,897
57	**2047**	2,775,436	1,119,664	1,216,814	228,502	(46,673)	257,129	195,034	418,039	240,144	-	177,895
58	**2048**	2,775,436	1,119,664	1,216,812	228,502	(46,673)	257,131	195,034	418,041	280,144	-	137,897
59	**2049**	2,775,436	1,119,664	1,216,813	228,502	(48,473)	258,930	195,034	419,841	280,144	-	139,697
60	**2050**	2,775,436	1,119,664	1,216,813	228,502	(50,273)	260,731	195,034	421,641	280,144	-	141,497
61	**2051**	2,775,436	1,119,664	1,216,812	228,502	(52,073)	262,531	195,034	423,442	280,144	-	143,298
62	**2052**	2,775,436	1,119,664	1,216,812	228,502	(53,873)	264,331	195,034	425,241	280,144	-	145,097
63	**2053**	2,775,436	1,119,664	1,216,812	228,502	(55,673)	266,131	195,034	427,041	280,144	-	146,897
64	**2054**	2,775,436	1,119,664	1,216,813	228,502	(57,473)	267,930	195,034	428,841	280,144	-	148,696
65	**2055**	2,775,436	1,119,664	1,216,813	228,502	(59,273)	269,730	195,034	430,640	280,144	-	150,496
66	**2056**	2,775,436	1,119,664	1,216,811	228,502	(61,073)	271,533	195,034	432,443	286,539	-	145,904
67	**2057**	2,775,436	1,119,664	1,216,810	228,502	(63,161)	273,620	195,034	434,531	240,144	-	194,387
68	**2058**	2,775,436	1,119,664	1,216,812	228,502	(63,161)	273,619	195,034	434,530	299,360	-	135,170
69	**2059**	2,775,436	1,119,664	1,216,815	228,502	(66,048)	276,503	195,034	437,413	243,163	-	194,250
70	**2060**	2,775,436	1,119,664	1,216,814	228,502	(66,180)	276,635	195,034	437,546	240,144	-	197,402
71	**2061**	2,775,436	1,119,664	1,216,814	228,502	(66,180)	276,636	195,034	437,546	240,144	-	197,402
72	**2062**	2,775,436	1,119,664	1,216,812	228,502	(66,180)	276,638	195,034	437,548	240,144	-	197,404
73	**2063**	2,775,436	1,119,664	1,216,812	228,502	(66,180)	276,637	195,034	437,548	240,144	-	197,404
74	**2064**	2,775,436	1,119,664	1,216,814	228,502	(66,180)	276,636	195,034	437,546	240,144	-	197,402
75	**2065**	2,775,436	1,119,664	1,216,811	228,502	(66,180)	276,638	195,034	437,549	240,144	-	197,405
76	**2066**	2,775,436	1,119,664	1,216,812	228,502	(66,180)	276,638	195,034	437,548	240,144	-	197,404
77	**2067**	2,775,436	1,119,664	1,216,814	228,502	(66,180)	276,636	195,034	437,546	240,144	-	197,402
78												
79	**GENERATION**											
80	**TOTALS**	232,632,802	78,253,210	108,154,153	17,829,816	8,389,360	20,006,262	14,902,267	33,397,269	23,744,305	712,831	8,940,132

1/CONSISTS OF DEPRECIATION PLUS OTHER NON-CASH EXPENSES AND OTHER ADJUSTMENTS AND ANY ACCOUNTING WRITE-OFFS INCLUDED IN EXPENSES.

2/INCLUDEs ADJUSTMENTS FOR ACCRUAL REVENUES OR OTHER ACCRUAL TO CASH ADJUSTMENTS.

Table 9: Generation Revised Revenue Test Income Statement

($000s)

		A	B
		2016	**2017**
1	REVENUES FROM PROPOSED RATES	2,847,676	2,874,596
2	OPERATING EXPENSES		
3	POWER SYSTEM GENERATION RESOURCES		
4	OPERATING GENERATION	685,954	748,609
5	OPERATING GENERATION SETTLEMENTS	19,323	19,651
6	NON-OPERATING GENERATION	1,600	1,863
7	CONTRACTED POWER PURCHASES	48,400	81,843
8	AUGMENTATION POWER PURCHASES	0	20,947
9	EXCHANGES & SETTLEMENTS	295,513	295,540
10	RENEWABLE GENERATION	40,987	41,641
11	GENERATION CONSERVATION	136,649	131,665
13	POWER NON-GENERATION OPERATIONS	96,542	99,836
14	PS TRANSMISSION ACQUISITION AND ANCILLARY SERVICES	186,998	195,831
15	F&W/USF&W/PLANNING COUNCIL	310,539	318,395
16	BPA INTERNAL SUPPORT	72,281	74,646
17	OTHER INCOME, EXPENSES AND ADJUSTMENTS	(97,577)	(129,463)
18	NON-FEDERAL DEBT SERVICE	594,308	594,839
19	DEPRECIATION	140,201	143,468
20	AMORTIZATION	82,350	85,034
21	TOTAL OPERATING EXPENSES	2,614,069	2,724,346
22	INTEREST EXPENSE		
23	INTEREST		
24	APPROPRIATED FUNDS	189,757	186,051
25	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
26	BONDS ISSUED TO U.S. TREASURY	56,935	69,299
27	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	0	0
28	NON-FEDERAL INTEREST	13,273	12,469
29	ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION	(10,731)	(11,360)
30	INTEREST CREDIT ON CASH RESERVES	(11,961)	(19,456)
31	NET INTEREST EXPENSE	191,336	191,065
32			
33	TOTAL EXPENSES	2,805,405	2,915,411
34			
35	NET REVENUES	42,271	(40,815)

Table 10: Generation Revised Revenue Test Statement of Cash Flow

($000s)

		A	B
		2016	**2017**
1	CASH PROVIDED BY OPERATING ACTIVITIES		
2	NET REVENUES	42,271	(40,815)
3	NON-CASH ITEMS:		
4	NON-FEDERAL INTEREST	13,273	12,469
5	DEPRECIATION AND AMORTIZATION	222,551	228,502
6	CAPITALIZATION ADJUSTMENT	(45,937)	(45,937)
7	NON-CASH REVENUES	(34,124)	(34,124)
8	CASH FLOW ADJUSTMENT (RESERVE)/APPLICATION	(41,500)	41,500
9	CASH PROVIDED BY OPERATING ACTIVITIES	156,534	161,595
10			
11	CASH USED FOR INVESTMENT ACTIVITIES		
12	INVESTMENT IN:		
13	FEDERAL UTILITY PLANT (INCLUDING AFUDC)	(211,153)	(403,151)
14	CONSERVATION	0	0
15	FISH & WILDLIFE	(55,000)	(50,000)
16	CASH USED FOR INVESTMENT ACTIVITIES	(266,153)	(453,151)
17			
18	CASH FROM (AND USED FOR) FINANCING ACTIVITIES		
19	INCREASE IN TREASURY DEBT	150,494	323,700
20	CUSTOMER PROCEEDS	63,306	0
21	REPAYMENT OF TREASURY DEBT	(10,500)	(35,150)
22	INCREASE IN FEDERAL CONSTRUCTION APPROPRIATIONS	52,353	129,451
23	REPAYMENT OF FEDERAL CONSTRUCTION APPROPRIATIONS	(84,197)	(74,279)
24	PAYMENT OF IRRIGATION ASSISTANCE	(61,066)	(51,482)
25	CASH USED FOR FINANCING ACTIVITIES	110,390	292,241
26			
27	ANNUAL INCREASE (DECREASE) IN CASH	771	685

Table 11: Generation Revenue from Proposed Rates – Results Through the Repayment Period

($000s)

	YEAR COMBINED CUMULATIVE	A REVENUES (STATEMENT A)	B OPERATION & MAINTENANCE (STATEMENT E)	C PURCHASE AND EXCHANGE POWER (STATEMENT E)	D DEPRECIATION	E NET INTEREST (STATEMENT D)	F NET REVENUES (F=A-B-C-D-E)	G NONCASH EXPENSES 1/ (COLUMN D)	H FUNDS FROM OPERATION 2/ (H=F+G)	I AMORTIZATION (REV REQ STUDY DOCUMENTATION)	J IRRIGATION AMORTIZATION (STATEMENT C)	K NET POSITION (K=H-I-J)
1	**2002**	53,734,071	8,765,016	36,248,938	3,428,034	5,499,734	(207,651)	3,436,330	3,199,127	2,754,877	41,703	402,547
2												
3	**GENERATION**											
4	**2003**	3,144,811	705,289	1,841,035	178,896	176,595	242,996	131,592	314,144	73,000		241,144
5	**2004**	2,738,898	713,549	1,366,265	177,298	162,531	319,255	129,789	354,413	233,000	739	120,674
6	**2005**	2,814,224	711,713	1,420,735	186,099	166,610	329,067	(98,072)	320,734	271,301		49,433
7	**2006**	2,853,659	773,510	1,436,548	181,878	157,609	304,114	(84,357)	537,237	261,276		275,961
8	**2007**	2,657,891	818,494	1,361,837	176,204	145,516	155,840	133,875	289,715	246,300		43,415
9	**2008**	2,383,688	802,849	1,224,722	183,466	142,746	29,905	28,438	195,087	277,483	2,950	(85,346)
10	**2009**	2,234,695	871,705	1,265,997	180,788	151,508	(235,303)	166,189	(69,114)	219,360		(288,474)
11	**2010**	2,385,607	883,540	1,393,796	184,989	176,928	(253,646)	120,913	(132,733)	244,673		(377,406)
12	**2011**	2,619,038	934,466	1,283,304	201,106	182,860	17,302	155,354	169,132	162,163		6,969
13	**2012**	2,631,334	962,711	1,260,404	199,286	169,748	39,185	153,534	174,395	193,000	1,182	(19,787)
14	**2013**	2,647,095	1,011,463	1,260,527	218,103	207,798	(50,796)	164,704	110,384	122,799	58,823	(71,238)
15	**2014**	2,810,919	1,017,269	896,127	227,267	196,361	473,895	143,049	596,116	462,575	52,547	80,994
16												
17	**COST EVALUATION**											
18	**PERIOD**											
19	**2015**	2,681,151	1,053,332	828,829	230,228	199,746	369,016	184,291	503,358	570,319	52,204	(119,165)
20												
21	**RATE APPROVAL**											
22	**PERIOD**											
23	**2016**	2,847,676	1,125,459	1,266,059	222,551	191,336	42,271	235,824	156,534	94,697	61,066	771
24	**2017**	2,874,596	1,119,664	1,376,180	228,502	191,065	(40,815)	240,971	161,595	109,429	51,482	685
25												
26	**REPAYMENT**											
27	**PERIOD**											
28	**2018**	2,874,596	1,119,664	1,330,049	228,502	206,559	(10,177)	195,034	150,733	109,904	27,612	13,217
29	**2019**	2,874,596	1,119,664	1,086,913	228,502	203,571	235,945	195,034	396,856	325,441	57,317	14,097
30	**2020**	2,874,596	1,119,664	1,133,352	228,502	204,774	188,304	195,034	349,214	309,557	24,639	15,018
31	**2021**	2,874,596	1,119,664	1,113,497	228,502	204,560	208,372	195,034	369,283	341,051	12,250	15,982
32	**2022**	2,874,596	1,119,664	1,119,483	228,502	200,057	206,890	195,034	367,800	336,393	14,417	16,990
33	**2023**	2,874,596	1,119,664	1,117,101	228,502	189,767	219,561	195,034	380,472	349,437	12,989	18,046
34	**2024**	2,874,596	1,119,664	1,069,647	228,502	183,076	273,707	195,034	434,617	400,236	15,231	19,150
35	**2025**	2,874,596	1,119,664	916,353	228,502	170,646	439,431	195,034	600,342	566,311	13,725	20,306
36	**2026**	2,874,596	1,119,664	921,136	228,502	142,410	462,884	195,034	623,794	581,335	20,944	21,515
37	**2027**	2,874,596	1,119,664	945,083	228,502	121,709	459,638	195,034	620,548	591,592	6,176	22,780
38	**2028**	2,874,596	1,119,664	983,635	228,502	108,358	434,437	195,034	595,347	559,954	11,288	24,104
39	**2029**	2,874,596	1,119,664	949,771	228,502	103,582	473,076	195,034	633,987	607,015	4,065	22,907
40	**2030**	2,874,596	1,119,664	880,143	228,502	61,369	584,918	195,034	745,828	719,682	1,996	24,151
41	**2031**	2,874,596	1,119,664	860,325	228,502	57,122	608,983	195,034	769,893	734,371	10,678	24,844
42	**2032**	2,874,596	1,119,664	807,380	228,502	28,469	690,580	195,034	851,491	826,646	-	24,844
43	**2033**	2,874,596	1,119,664	777,750	228,502	(3,751)	752,432	195,034	913,342	884,151	4,347	24,844
44	**2034**	2,874,596	1,119,664	782,683	228,502	(36,172)	779,919	195,034	940,829	851,590	-	89,240
45	**2035**	2,874,596	1,119,664	782,701	228,502	(52,095)	795,824	195,034	956,734	240,144	7,875	708,715
46	**2036**	2,874,596	1,119,664	782,765	228,502	(52,094)	795,759	195,034	956,669	240,144	28,920	687,605
47	**2037**	2,874,596	1,119,664	782,123	228,502	(52,103)	796,410	195,034	957,321	240,144	16,078	701,099
48	**2038**	2,874,596	1,119,664	772,100	228,502	(52,237)	806,567	195,034	967,477	240,144	-	727,333
49	**2039**	2,874,596	1,119,664	739,867	228,502	(52,667)	839,230	195,034	1,000,141	240,144	14,181	745,815
50	**2040**	2,874,596	1,119,664	737,557	228,502	(52,698)	841,570	195,034	1,002,481	240,144	-	762,337
51	**2041**	2,874,596	1,119,664	730,624	228,502	(52,791)	848,596	195,034	1,009,507	240,144	-	769,363
52	**2042**	2,874,596	1,119,664	730,623	228,502	(52,791)	848,597	195,034	1,009,508	240,144	73,659	695,705
53	**2043**	2,874,596	1,119,664	730,621	228,502	(52,791)	848,600	195,034	1,009,510	240,144	-	769,366
54	**2044**	2,874,596	1,119,664	852,880	228,502	(51,158)	724,709	195,034	885,619	240,144	-	645,475
55	**2045**	2,874,596	1,119,664	1,216,813	228,502	(46,300)	355,917	195,034	516,827	240,144	11,749	264,935
56	**2046**	2,874,596	1,119,664	1,216,812	228,502	(46,300)	355,918	195,034	516,828	240,144	-	276,684
57	**2047**	2,874,596	1,119,664	1,216,814	228,502	(46,300)	355,916	195,034	516,826	240,144	-	276,682
58	**2048**	2,874,596	1,119,664	1,216,812	228,502	(46,300)	355,918	195,034	516,828	280,144	-	236,684
59	**2049**	2,874,596	1,119,664	1,216,813	228,502	(48,100)	357,717	195,034	518,628	280,144	-	238,484
60	**2050**	2,874,596	1,119,664	1,216,813	228,502	(49,900)	359,518	195,034	520,428	280,144	-	240,284
61	**2051**	2,874,596	1,119,664	1,216,812	228,502	(51,700)	361,318	195,034	522,229	280,144	-	242,085
62	**2052**	2,874,596	1,119,664	1,216,812	228,502	(53,500)	363,118	195,034	524,028	280,144	-	243,884
63	**2053**	2,874,596	1,119,664	1,216,812	228,502	(55,300)	364,918	195,034	525,828	280,144	-	245,684
64	**2054**	2,874,596	1,119,664	1,216,813	228,502	(57,100)	366,717	195,034	527,628	280,144	-	247,483
65	**2055**	2,874,596	1,119,664	1,216,813	228,502	(58,900)	368,517	195,034	529,427	280,144	-	249,283
66	**2056**	2,874,596	1,119,664	1,216,811	228,502	(60,700)	370,320	195,034	531,230	286,539	-	244,691
67	**2057**	2,874,596	1,119,664	1,216,810	228,502	(62,788)	372,407	195,034	533,318	240,144	-	293,174
68	**2058**	2,874,596	1,119,664	1,216,812	228,502	(62,788)	372,406	195,034	533,317	299,360	-	233,957
69	**2059**	2,874,596	1,119,664	1,216,815	228,502	(65,675)	375,290	195,034	536,200	243,163	-	293,037
70	**2060**	2,874,596	1,119,664	1,216,814	228,502	(65,807)	375,422	195,034	536,333	240,144	-	296,189
71	**2061**	2,874,596	1,119,664	1,216,814	228,502	(65,807)	375,423	195,034	536,333	240,144	-	296,189
72	**2062**	2,874,596	1,119,664	1,216,812	228,502	(65,807)	375,425	195,034	536,335	240,144	-	296,191
73	**2063**	2,874,596	1,119,664	1,216,812	228,502	(65,807)	375,424	195,034	536,335	240,144	-	296,191
74	**2064**	2,874,596	1,119,664	1,216,814	228,502	(65,807)	375,423	195,034	536,333	240,144	-	296,189
75	**2065**	2,874,596	1,119,664	1,216,811	228,502	(65,807)	375,425	195,034	536,336	240,144	-	296,192
76	**2066**	2,874,596	1,119,664	1,216,812	228,502	(65,807)	375,425	195,034	536,335	240,144	-	296,191
77	**2067**	2,874,596	1,119,664	1,216,814	228,502	(65,807)	375,423	195,034	536,333	240,144	-	296,189
78												
79	**GENERATION**											
80	**TOTALS**	237,789,153	78,253,210	108,154,153	17,829,816	8,403,269	25,148,704	14,994,141	38,539,711	23,744,305	712,831	14,082,574

1/CONSISTS OF DEPRECIATION PLUS OTHER NON-CASH EXPENSES AND OTHER ADJUSTMENTS AND ANY ACCOUNTING WRITE-OFFS INCLUDED IN EXPENSES.

2/INCLUDEs ADJUSTMENTS FOR ACCRUAL REVENUES OR OTHER ACCRUAL TO CASH ADJUSTMENTS.

Table 12: Amortization of Generation Investments Over Repayment Period
($000s)

	A	B	C	D	E	F	G	H	I	J	K
		Investments Placed in Service							Irrigation Assistance		
	Fiscal Year	Original & New Obligations	Replacements	Cumulative Amount In Service	Due Amortization	Discretionary Amortization	Unamortized Investment	Term Investment Schedule	Cumulative Amount In Service	Amortization	Unamortized Amount
1	2015	12,036,524	-	12,036,524	110,000	230,461	5,149,811	6,929,044	554,887	52,204	502,683
2	2016	296,153	-	12,332,677	10,500	84,197	5,351,268	7,211,994	-	61,066	441,617
3	2017	439,151	-	12,771,828	35,150	74,279	5,680,990	7,549,869	-	51,482	390,135
4	2018	-	240,144	13,011,972	9,000	100,904	5,811,230	7,735,808	-	27,612	362,523
5	2019	-	240,144	13,252,116	252,250	73,191	5,725,933	7,588,930	-	57,317	305,206
6	2020	-	240,144	13,492,260	229,100	80,457	5,656,519	7,486,145	-	24,639	280,567
7	2021	-	240,144	13,732,405	169,800	171,251	5,555,613	7,472,641	-	12,250	268,317
8	2022	-	240,144	13,972,549	104,500	231,893	5,459,364	7,540,573	-	14,417	253,900
9	2023	-	240,144	14,212,693	190,000	159,437	5,350,072	7,417,704	-	12,989	240,911
10	2024	-	240,144	14,452,837	117,000	283,236	5,189,980	7,518,580	-	15,231	225,680
11	2025	-	240,144	14,692,981	69,000	497,311	4,863,813	7,423,235	-	13,725	211,956
12	2026	-	240,144	14,933,125	119,000	462,335	4,522,621	7,308,191	-	20,944	191,012
13	2027	-	240,144	15,173,269	61,000	530,592	4,171,173	7,364,437	-	6,176	184,836
14	2028	-	240,144	15,413,414	3,000	556,954	3,851,363	7,331,381	-	11,288	173,548
15	2029	-	240,144	15,653,558	61,000	546,015	3,484,492	7,231,104	-	4,065	169,483
16	2030	-	240,144	15,893,702	8,000	711,682	3,004,954	7,438,134	-	1,996	167,487
17	2031	-	240,144	16,133,846	-	734,371	2,510,727	7,613,926	-	10,678	156,810
18	2032	-	240,144	16,373,990	-	826,646	1,924,225	7,600,557	-	-	156,810
19	2033	-	240,144	16,614,134	-	884,151	1,280,219	7,473,867	-	4,347	152,463
20	2034	-	240,144	16,854,279	-	851,590	668,773	7,581,011	-	-	152,463
21	2035	-	240,144	17,094,423	-	240,144	668,773	7,723,942	-	7,875	144,587
22	2036	-	240,144	17,334,567	-	240,144	668,773	7,897,822	-	28,920	115,667
23	2037	-	240,144	17,574,711	-	240,144	668,773	8,003,430	-	16,078	99,589
24	2038	-	240,144	17,814,855	-	240,144	668,773	8,057,726	-	-	99,589
25	2039	-	240,144	18,054,999	-	240,144	668,773	8,141,870	-	14,181	85,408
26	2040	-	240,144	18,295,144	-	240,144	668,773	8,298,257	-	-	85,408
27	2041	-	240,144	18,535,288	-	240,144	668,773	8,414,651	-	-	85,408
28	2042	-	240,144	18,775,432	-	240,144	668,773	8,552,921	-	73,659	11,749
29	2043	-	240,144	19,015,576	-	240,144	668,773	8,446,587	-	-	11,749
30	2044	-	240,144	19,255,720	-	240,144	668,773	8,589,944	-	-	11,749
31	2045	-	240,144	19,495,864	-	240,144	668,773	8,709,142	-	11,749	-
32	2046	-	240,144	19,736,008	-	240,144	668,773	8,891,438	-	-	-
33	2047	-	240,144	19,976,153	-	240,144	668,773	9,032,272	-	-	-
34	2048	-	240,144	20,216,297	-	280,144	628,773	9,272,416	-	-	-
35	2049	-	240,144	20,456,441	-	280,144	588,773	9,468,560	-	-	-
36	2050	-	240,144	20,696,585	-	280,144	548,773	9,622,098	-	-	-
37	2051	-	240,144	20,936,729	-	280,144	508,773	9,753,332	-	-	-
38	2052	-	240,144	21,176,873	-	280,144	468,773	9,979,550	-	-	-
39	2053	-	240,144	21,417,018	-	280,144	428,773	10,144,107	-	-	-
40	2054	-	240,144	21,657,162	-	280,144	388,773	10,277,117	-	-	-
41	2055	-	240,144	21,897,306	46,395	280,144	302,378	10,371,772	-	-	-
42	2056	-	240,144	22,137,450	-	240,144	302,378	10,233,335	-	-	-
43	2057	-	240,144	22,377,594	-	240,144	302,378	10,416,467	-	-	-
44	2058	-	240,144	22,617,738	59,216	240,144	243,163	10,597,396	-	-	-
45	2059	-	240,144	22,857,883	3,018	240,144	240,144	10,685,917	-	-	-
46	2060	-	240,144	23,098,027	-	240,144	240,144	10,864,253	-	-	-
47	2061	-	240,144	23,338,171	-	240,144	240,144	10,982,947	-	-	-
48	2062	-	240,144	23,578,315	-	240,144	240,144	11,114,430	-	-	-
49	2063	-	240,144	23,818,459	-	240,144	240,144	11,010,095	-	-	-
50	2064	-	240,144	24,058,603	-	240,144	240,144	10,905,391	-	-	-
51	2065	-	240,144	24,298,747	-	240,144	240,144	10,784,000	-	-	-
52	2066	-	240,144	24,538,892	-	240,144	240,144	10,731,647	-	-	-
53	2067	-	240,144	24,779,036	-	240,144	240,144	10,602,196	-	-	-
54	Totals	**$12,771,828**	**$12,007,208**		**$1,656,929**	**$16,335,712**				**$554,887**	

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BONNEVILLE POWER ADMINISTRATION
July 2015